

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 1. Agronomic data from the western regional hard red winter wheat 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 11, 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.
WA 6239	Burt/Falco//Burt	72.70a	57.40	166.00a	39.25	72.50	4.75b
ID 745101	ID 5011/ID 5006	66.72a	57.70	169.75a	29.75b	57.00	2.00b
ID 113	CI14106/McCall, Sel.1	66.12a	57.80	164.75a	36.00b	87.50	5.50b
ID 114	CI 14106/McCall, Sel. 2	64.75a	57.40	164.50a	35.75b	76.25	6.75
UT 89099	Utah Sel. 89099	60.82a	55.20	165.00a	32.50b	85.00	4.75b
ID 75537	WA4765//Burt/PI178383	60.65a	51.30	165.75a	30.75b	60.00	4.75b
WA 6367	Suwon 92/Burt//WSR	59.67a	56.00	164.00a	30.50b	15.00b	2.75b
ID 103	II-60-157/Wanser//McCall	58.12a	54.30	163.00	33.00b	37.50b	3.25b
UT 890134	Utah Selection	57.92a	57.10	166.00a	37.00	25.00b	3.50b
WA 6364	Koelz 7941/2*McCall	57.84a	61.50	166.50a	38.25	87.50	5.00b
UT 890123	Utah Sel. 890123	57.84a	58.00	165.50a	38.25	65.00	4.00b
ID 755519		57.67a	61.00	170.25a	44.00a	35.00	5.00b
CI 12933	Itana	57.62a	59.20	165.75a	44.00a	85.00	5.25b
WA 6365	Koelz 7941/2*McCall	57.32a	60.40	167.50a	41.75a	65.00	5.50b
CI 13844	Wanser	56.77a	58.70	165.00a	42.75a	85.00	5.25b
UT 81919	DM/CLM//Burt/PI 178383	53.89	60.00	164.75a	44.25a	75.00	4.50b
UT 890152	Utah Sel. 890152	53.62	57.40	168.75a	32.75b	45.00b	4.25b
WA 7003	PI173467/II//Wanser	52.47	57.90	167.00a	40.75a	85.00	6.25
ID 126	A68227W-B-7-14-3-1	51.82	57.10	164.75a	44.50a	87.50	6.50
ID 127	A68231W-A-5-7-1	50.54	60.10	167.75a	41.25a	75.00	5.75b
ID 102	A68230W-D-3-1-1	47.19	59.20	167.75a	39.50	70.00	6.75
CI 13880	Crest	45.82	55.00	163.00	38.75	71.25	7.00
ID 745103	Pope//Bez/3/Burt/178383	45.29	60.60	172.00a	43.75a	62.50	5.50b
ID 101	A68229W-A-1-8-5	45.21	57.70	165.25a	39.75	70.00	6.50
CI 1442	Kharkof	39.66	58.00	168.00a	43.75a	67.50	7.00
ID 745102	Bez//Burt/178383/3/Ark	39.16	58.70	164.75a	44.75a	80.00	5.00b
	$\bar{x}$	55.29	57.87	166.27	38.74	66.42	5.12
	F <sub>2</sub>	6.11**	.00	47.61**	48.79**	4.91**	11.34**
	S.E. $\bar{x}$	3.31	.00	.32	.69	9.03	.39
	L.S.D. (.05)	9.31	.00	.90	1.94	25.41	1.09
	C.V. %	5.99	.00	.19	1.78	13.60	7.58

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

Date seeded: September 30, 1976  
Size of plot: 32 sq. ft.

Date harvested: August 17, 1977

C.I. or State No.	Variety	Yield Bu/A	Test Wt Lbs/Bu	Plant Ht (in)	Lodging	
					%	Sev.
WA 6364	Koelz 7941/2*McCall	39.61a	60.50	24.75a	99.00	1.00
UT 89099	Utah Sel. 89099	38.93a	58.00	25.25a	54.50b	2.00a
ID 127	A68231W-A-5-7-1	38.76a	59.20	27.75a	12.50b	3.50a
WA 6367	Suwon 92/Burt//WSR	38.71a	57.10	21.50	99.00	1.00
ID 745101	ID 5011/ID 5006	38.46a	56.50	21.25	99.00	1.00
WA 6239	Burt/Falco//Burt	37.74a	55.50	25.25a	99.00	1.00
WA 6365	Koelz 7941/2*McCall	35.85	59.00	26.75a	99.00	1.00
ID 103	II-60-157/Wanser//McCall	35.32	59.40	22.25	99.00	1.00
ID 114	CT 14106/McCall, Sel. 2	35.10	59.30	25.00a	99.00	1.00
UT 890152	Utah Sel. 890152	34.97	57.30	25.25a	99.00	1.00
ID 113	CI 14106/McCall, Sel. 1	34.31	58.80	23.75	99.00	1.00
UT 890123	Utah Sel. 890123	33.85	58.90	27.75a	99.00	1.00
WA 7003	PI 173467/II//Wanser	33.54	57.00	25.50a	99.00	1.00
ID 755519		33.35	60.00	31.25a	99.00	1.00
ID 745102	Bez//Burt/178383/3/Ark	33.21	57.60	26.75a	76.75	1.50
CI 12933	Itana <sub>1</sub> /	32.64	55.70	27.75a	99.00	1.00
CI 13880	Crest <sub>1</sub> /	32.61	56.50	22.50	99.00	1.00
UT 81919	DM/CLM//Burt/PI 178383	32.36	57.50	31.00a	99.00	1.00
ID 101	A68229W-A-1-8-5	32.15	57.10	27.25a	54.50b	2.00a
CI 13844	Wanser	31.92	58.10	27.00a	99.00	1.00
ID 102	A68230W-D-3-1-1	31.54	57.80	25.75a	54.50b	1.75a
UT 890134	Utah Selection	31.46	58.50	25.75a	99.00	1.00
ID 75537	WA 4765//Burt/PI 178383	30.74	52.70	23.25	99.00	1.00
CI 1442	Kharkof	29.50	55.50	30.00a	99.00	1.00
ID 745103	Pope//Bez/3/Burt/178383	28.77	57.50	27.25a	84.25	1.50
ID 126	A68227W-B-7-14-3-1	27.92	57.70	30.00a	55.00b	5.00a
	$\bar{x}_2$	33.97	57.64	26.06	87.42	1.39
	F <sub>2</sub>	3.38**	.00	12.89**	4.68**	13.25**
	S.E. $\bar{x}$	1.77	.00	.76	10.38	.25
	L.S.D. (.05)	4.99	.00	2.13	29.18	.71
	C.V. %	5.22	.00	2.91	11.87	18.17

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