

TITLE: Winter Wheat  
PROJECT: Small Grains Investigations MS 756  
YEAR: 1976  
PERSONNEL: Leader - Vern R. Stewart  
 Research Technician - Nancy Campbell  
 Cooperator - G. A. Taylor  
 Cooperating Agencies - Montana Agricultural Experiment Station  
 Montana Wheat Research and Marketing  
 Committee

OBJECTIVES:

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

1976 EXPERIMENTS:

1. Western Regional Hard Red Winter Nursery
2. Off Station Nurseries
3. Western Regional White Winter Nursery

SUMMARY OF 1976 RESULTS:

Western Regional Hard Red Winter Nursery -

Kalispell - Four varieties yielded significantly higher than the check, Crest, and three yielded significantly lower. The rain at harvest time contributed to the low test weights. Lodging was fairly severe this year. No variety's lodging severity was significantly less than Crest, but four were significantly greater. Dwarf smut readings were very low this year. Since there was a low level of dwarf smut even in the susceptible varieties it cannot be deduced that the low readings indicate resistance. Table 1.

Stillwater - Yield data obtained from this nursery was found to be non-significant. Yields were good for the location with a mean yield of 41.49. Test weights tend to be low. Dwarf smut readings tend to be lower this year with varieties exhibiting lower readings or no dwarf smut that have shown higher readings in previous years. No variety has a dwarf smut reading significantly lower than Crest, but seven are significantly higher. Table 2.

Table 3, gives a summary of the data from the two locations. Yields were good this year, but test weights were low.

Off Station Nurseries -

Four off station nurseries were planted in the fall of 1975. The nursery in Missoula County was abandoned because of poor stands. The other three are reported below.

Lake County - The nursery's mean yield was 46.67 bu/a. All but two varieties yielded significantly higher than the check, Crest. Test weights were low. Five varieties had lodging severities less than Crest. Table 4.

Summary of 1976 Results (con't)

Ravalli County - Seven varieties yielded significantly lower than the check Crest, no varieties were significantly higher. The nursery's mean yield was 53.81 bu/a. Test weights ran a little low. Most varieties had lodging severity readings significantly lower than Crest. Table 5.

Sanders County - The mean yield was 16.41 bu/a. Four varieties had yields significantly higher than the check Crest. Only two test weights were obtainable, the other had insufficient amounts of grain. Sprague and Luke had lodging severity readings significantly higher than Crest. Table 6.

Western Regional White Winter Wheat Nursery -

Kalispell - The nursery's mean yield was 80.0 bu/a. Four varieties yielded significantly higher than the check, Nugaines and four varieties yielded significantly lower. Test weights tended to be low. Nine varieties had heading dates significantly later than Nugaines and four varieties were significantly earlier. Table 7.

In the summary over several years Nugaines was used as a check. Fourteen varieties had yields higher than Nugaines. Table 8.

Stillwater - This was the first year this nursery was grown at this location. Yields were good for this area, with a mean of 45.59 bu/a. Six varieties yielded significantly higher than the check, Nugaines. Elgin had the highest level of dwarf smut and was the only variety whose level was significantly higher than Nugaines. No variety was free of dwarf smut. Sprague with a dwarf smut reading of .50% was the lowest. Table 9.

A summary of the data from both locations was compiled. Yields were fairly good, but test weights tend to be low. Dwarf smut readings were obtained only from the Stillwater location and all varieties were affected. Table 10.



Table 1. Agronomic data from the Western Regional Hard Red Winter Wheat Nursery grown at the Northwestern Agricultural Research Center, Kalispell, MT. in 1976. Field E-3. Random block design, four replications.

Date seeded: September 18, 1975 Date harvested: August 30, 1976 Size of Plot: 16 sq. ft.

C.I. or State No.	Variety	Yield Bu/a	Test Wt Lbs/Bu	Heading Date	Plant Height	Lodging		Dwarf Smut %	% Leaf Rust	Stripe Rust	
						%	Sev.			%	Sev.
CI 13844	Wanser	79.38a	58.30	161.50	43.75	75.00	5.00	.00	2.25	3.75	1.00
ID 103	II-60-157/Wanser//McCall	78.68a	57.30	161.00	35.25b	72.50	6.00	.00	10.00	1.25	.25
WA 6239	Burt/Falco//Burt	78.63a	55.80	164.25a	38.50	55.00	5.25	.00	6.25	2.50	1.00
UT 88616	Utah Sel. 88616	73.52a	55.70	161.00	41.00	82.50	6.25	.00	1.25	.50	.25
ID 92	Minn2601255/CI14106//Mc	71.62	57.50	164.25a	38.50	85.00	6.75	.00	6.25	6.25	2.00
WA 6243	Washington Sel. 6243	71.60	55.80	161.25	40.75	75.00	6.75	.50	6.25	15.00	2.75
ID 755519	BZ//Burt/PI178383	70.95	59.60	169.00a	47.25a	85.00	6.00	.00	6.75	6.25	2.75
ID 745101	ID 5011/ID 5006	69.77	55.90	169.00a	38.25	70.00	7.50a	.00	4.25	3.75	2.00
WA 7003	PI173467/IT//Wanser	68.62	57.70	165.00a	43.75	90.00a	6.50	1.00a	5.00	5.00	.75
ID 101	A68229WA185	67.65	56.20	163.75a	41.25	85.00	7.50a	.00	3.75	5.00	1.75
ID 75537	WA4765//Burt/PI178383	66.37	50.60	165.00a	35.25b	92.25a	8.00a	.00	4.25	5.00	1.25
UT 819164	DM/CLM//Burt/PI178383	64.67	60.50	165.75a	48.75a	82.50	5.75	.00	12.50	2.50	.50
UT 81909	DM/CLM//Burt/PI178383	64.42	60.50	161.50	47.75a	82.50	6.25	.00	6.25	1.25	.25
ID 102	A68230W-D-3-1-1	64.00	57.40	165.50a	46.00a	85.00	6.50	.00	6.25	42.50a	5.25a
CI 12933	Itana <sub>1</sub>	61.47	58.90	163.25a	46.75a	82.50	6.50	.75	5.00	61.00a	5.50a
CI 13880	Crest <sub>1</sub>	61.20	57.90	161.00	42.00	70.00	6.00	.00	6.25	3.75	1.25
ID 113	CI 14106/MCCall, Sel.1	60.82	57.80	163.25a	41.00	77.50	7.00	.00	5.00	6.25	2.75
ID 745102	BEZ//Burt/178383/3/Ark	59.57	58.20	162.75a	45.25	67.50	6.50	.00	10.00	6.25	1.25
ID 114	CI 14106/McCall, Sel.2	59.49	56.20	163.00a	43.50	90.00a	8.75a	.00	15.00a	13.75	2.25
UT 819506	DM/CLM//Burt/PI178383	56.02	56.90	167.25a	49.25a	73.75	7.25	.00	5.00	.00	.00
ID 745103	Pope//Bex/3/Burt/178383	55.87	56.30	171.25a	49.00a	72.50	6.50	.00	3.00	3.75	1.00
UT 82380	Caddo//Burt/PI178383	55.77	60.00	163.00a	45.75	72.50	6.25	.00	18.75a	12.50	1.00
UT 819533	DM/CLM//Burt/PI178383	49.52b	59.50	169.00a	44.25	65.00	4.75	.00	4.25	6.25	3.25a
CI 1442	Kharkof	46.62b	56.90	168.00a	47.25a	65.00	6.50	.00	3.50	15.00	2.75
CI 17296	Hansel	44.41b	59.60	164.50a	45.75	67.50	7.25	.00	5.00	3.75	1.50
	$\bar{x}$	64.03	57.48	164.56	43.43	76.84	6.53	.09	6.48	9.31	1.77
	F <sub>2</sub>	5.84**	.00	63.03**	9.19**	2.26**	3.69**	5.19**	1.81*	4.53**	6.37**
	S.E. $\bar{x}$	3.92	.00	.37	1.36	6.19	.47	.11	2.97	6.44	.56
	L.S.D.. (05)	9.24	.00	1.04	3.84	17.47	1.31	.32	8.38	18.17	1.59
	C.V.%	6.12	.00	.22	3.13	8.06	7.12	126.28	45.88	69.22	31.78

1/ Check Variety

2/ Value for variety comparison

\* Indicates statistical significance at the .05 level

\*\* Indicates statistical significance at the .01 level

a/ Value significantly greater than the check (.05)

b/ Value significantly less than the check (.05)

Table 2. Agronomic data from the Western Regional Hard Red Winter Wheat Nursery grown at the Lance Claridge farm, Kalispell, MT, in 1976. Random block design, four replications. Date seeded: September 25, 1975 Date harvested: September 1, 1976 Size of plot: 16 sq. ft.

C.I. or State No	Variety	Yield Bu/A	Test Wt Lbs/Bu	Plant Height	Lodging		Dwarf Smut %	Stripe Rust	
					%	Sev.		%	Sev.
ID 75537	WA4765//Burt/ PI 178383	49.39	57.00	31.00	24.75	.25b	.50	.00	.00
UT819533	DM/CLM//Burt/ PI 178383	46.42	59.90	39.50a	.00	.00b	.00	1.25	1.25
UT819506	DM/CLM//Burt/ PI 178383	46.37	56.80	41.50a	36.00	2.00	.25	.00	.00
ID 114	CI 14106/McCall, Sel.2	44.69	59.20	33.25	99.00a	1.00b	.00	.00	.00
ID 102	A68230W-D-3-1-1	44.19	58.70	33.75	26.25	3.00	.50	3.75a	2.75a
ID755519	BZ//Burt/ PI178383	44.06	61.80	38.75a	74.25a	.75b	.25	1.25	.75
WA 6243	Washington Sel. 6243	43.69	58.70	30.50	76.75a	1.25b	9.00a	3.75a	2.25a
WA 6239	Burt/Falco// Burt	43.64	55.70	31.75	74.25a	.75b	7.75a	.00	.00
UT819164	DM/CLM//Burt/ PI178383	42.86	61.40	40.50a	1.25	.75b	.50	.00	.00
UT 81909	DM/CLM//Burt/ PI178383	42.74	61.40	39.25a	74.25a	.75b	.25	.00	.00
CI 13880	Crest	42.09	58.50	32.00	12.50	3.00	.25	.00	.00
ID 101	A68229WA185	41.96	59.80	32.75	28.50	1.00b	.50	.00	.00
UT 88616	Utah Sel. 88616	41.74	60.70	32.00	49.50	.50b	1.00	.00	.00
ID 113	CI14106/McCall Sel.1	41.66	60.10	31.00	75.50a	1.50b	.75	1.25	.75
ID745101	ID5011/ID5006	41.64	59.00	29.00b	.00	.00b	.75	.00	.00
UT 82380	Caddo//Burt/ PI178383	40.91	61.00	37.25a	74.25a	.75b	.00	.00	.00
CI 17296	Hansel	40.84	60.80	39.25a	49.75	2.25	.75	.00	.00
WA 7003	PI173467/IT// Wanser	40.79	57.70	33.00	53.25	1.25b	9.50a	.00	.00
ID745102	BEZ//Burt / 178383/3/Ark	40.09	58.50	38.25a	28.50	2.50	1.25	.00	.00
ID745103	Pope//BEZ/3/ Burt/178383	39.39	57.90	39.25a	76.75a	1.50b	2.25	.00	.00
ID 92	Minn2601255// CI14106//MC	39.36	58.10	30.00	24.75	.25b	.00	.00	.00
CI 12933	Itana	37.11	59.70	37.25a	78.00a	1.50b	7.00a	5.00a	3.50a
CI 1442	Kharkof	35.94	60.40	40.75a	10.00	3.00	9.50a	1.25	.75
ID 103	II-60-157/ Wanser//McCall	33.94	59.40	29.25b	.00	.00b	17.25a	.00	.00
CI 13844	Wanser	31.74	56.80	35.25a	76.75a	1.25b	20.75a	1.25	.75
	x	41.49	59.16	35.04	44.99	1.23	3.62	.75	.51
	F <sub>2</sub>	.78NS	.00	26.76**	2.48**	6.50**	9.11**	4.67**	4.54**
	S.E. $\bar{x}$	4.40	.00	.79	19.91	.37	1.89	.65	.45
	L.S.D. (.05)	12.41	.00	2.23	56.14	1.04	5.33	1.82	1.27
	C.V. %	10.61	.00	2.26	44.25	29.91	52.23	86.25	88.46

1/Check variety

2/Value for variety comparison

\*Indicates statistical significance at .05 level. b/Value significantly less than

\*\*Indicates statistical significance at .01 level the check (.05)

a/Value significantly greater than the check (.05)



Table 3. Summary of agronomic data from the Western Regional Hard Red Winter Wheat Nursery grown at the Northwestern Agricultural Research Center and Stillwater in 1976.

CI or State No	Variety	Yield <sup>1/</sup> Bu/A <sup>1/</sup>	Test Wt <sup>1/</sup> Lbs/Bu <sup>1/</sup>	Heading Date <sup>2/</sup>	Plant <sup>1/</sup> Height	Lodging <sup>1/</sup> % Sev.		% Dwarf <sup>3/</sup> Smut <sup>3/</sup>
CI 13844	Wanser	55.56	57.55	161.50	39.50	75.88	3.13	20.75a
ID 103	II-60-157/ Wanser//McCall	56.31	58.35	161.00	32.25	36.25	3.00	17.25a
WA 6239	Burt/Falco//Burt	61.14	55.80	164.25a	35.13	64.63	3.00	7.75a
UT 88616	Utah Sel. 88616	57.63	58.20	161.00	36.50	66.00	3.38	1.00
ID 92	Minn. 2601255/ CI14106//Mc	55.49	57.20	164.25a	34.25	54.88	3.50	.00
WA 6243	Washington Sel. 6243	57.65	57.25	161.25	35.63	75.88	4.00	9.00a
ID755579	BZ//Burt/PI178383	57.51	60.70	169.00a	43.00	79.63	3.38	.25
ID745101	ID 5011/ID 5006	55.71	57.45	169.00a	33.63	35.00	3.75	.75
WA 7003	PI173467/IT// Wanser	54.71	57.70	165.00a	38.38	71.63	3.88	9.50a
ID 101	A68229 WA185	54.81	58.00	163.75a	37.00	56.75	4.25	.50
ID 75537	WA4765//Burt/ PI 178383	57.88	53.80	165.00a	33.13	58.50	4.13	.50
UT819164	DM/CLM//Burt/ PI 178383	53.77	60.95	165.75a	44.63	41.88	3.25	.50
UT 81909	DM/CLM//Burt/ PI 178383	53.58	60.95	161.50	43.50	78.38	3.50	.25
ID 102	A68230W-D-3-1-1	54.10	58.05	165.50a	39.88	55.66	4.75	.50
CI 12933	Itana <sup>4/</sup>	49.29	59.30	163.25a	42.00	80.25	4.00	7.00a
CI 13880	Crest <sup>4/</sup>	51.65	58.20	161.00	37.00	41.25	4.50	.25
ID 113	CI 14106/McCall, Sel. 1	51.24	58.95	163.25a	36.00	76.50	4.25	.75
ID745102	Bez//Burt/ 178383/3/Ark	49.83	50.35	162.75a	41.75	48.00	4.50	1.25
ID 114	CI14106/McCall, Sel. 2	52.09	57.70	163.00a	38.38	94.50	4.88	.00
UT819506	DM/CLM//Burt/ PI 178383	51.20	56.90	167.25a	45.38	54.88	4.63	.25
ID745103	Pope//Bez/3/ Burt/178383	47.63	57.10	171.25a	44.13	74.63	4.00	2.25
UT 82380	Caddo//Burt/ PI 178383	48.34	60.50	163.00a	41.50	73.38	3.50	.00
UT819533	DM/CLM//Burt/ PI 178383	49.97	59.70	169.00a	41.88	35.50	2.80	.00
CI 1442	Kharkof	41.28	58.65	168.00a	44.00	37.50	4.75	9.50a
CI 17296	Hansel	42.63	60.20	164.50a	42.50	58.63	4.75	.75

<sup>1/</sup>  $\bar{x}$  for Northwestern Agricultural Research Center and Stillwater

<sup>2/</sup>  $\bar{x}$  for Northwestern Agricultural Research Center only

<sup>3/</sup>  $\bar{x}$  for Stillwater only

<sup>4/</sup> Check variety

<sup>a/</sup> Value significantly greater than the check (.05)

<sup>b/</sup> Value significantly less than the check (.05)

Table 4. Agronomic data from the off station winter wheat nursery grown in Lake County on the Norman (Bud) Trost farm, Ronan, MT. in 1976. Random block design, four replications.

Date seeded: September 24, 1975 Date harvested: August 25, 1976  
Size of plot: 16 sq. ft.

C.I. or State No.	Variety	Yield Bu/a	Test Wt Lbs/Bu	Plant Height	Lodging	
					%	Sev.
MT 6829		43.40	54.8	33.00a	60.00	4.25a
17295	Cardon	49.32a	55.8	37.75a	52.50	3.50
8885	Cheyenne	44.65a	55.8	35.75a	45.00	3.25
WA 5826		47.30a	52.8	26.00b	0.00	0.00b
15317	Franklin	54.50a	55.8	40.00a	62.50	3.75
WA 6099		47.97a	54.0	28.00	74.25	0.75b
ID 0037	Jeff	45.62a	56.7	38.00a	22.50	3.00
17296	Hansel	34.85	55.9	38.00a	25.00	3.00
17298	Peck	40.42a	55.3	31.00a	76.75	1.50
13968	Nugaines	46.85a	55.2	27.25	57.00	2.00
14586	Luke	58.74a	51.1	26.25b	54.50	2.00
14564	Hyslop	50.84a	52.8	25.25b	74.25	0.75b
OR 7147		44.80a	53.2	24.25b	74.25	0.75b
14485	Paha <sup>1/</sup>	44.72a	54.9	29.75	49.50	0.50b
13880	Crest <sup>1/</sup>	35.13	55.2	28.75	34.75	2.50
15376	Sprague	51.50a	51.0	29.00	47.50	4.25a
$\bar{x}$		46.67	54.4	31.13	50.64	2.23
$F^2/$		4.02**	0.0	55.93**	N.S.	10.15**
S.E. $\bar{x}$		30.30	0.0	0.70	19.37	0.44
L.S.D. (.05)		8.61	0.0	1.99	55.05	1.25
C.V. %		6.49	0.0	2.25	38.24	19.72

<sup>1/</sup> Check variety

<sup>2/</sup> Value for variety comparison

\* Indicates statistical significance at the .05 level.

\*\* Indicates statistical significance at the .01 level.

a/ Values significantly greater than the check (.05)

b/ Values significantly less than the check (.05)

Table 5. Agronomic data from the off station winter wheat nursery grown in Ravalli County on the Ross McIntyre farm, Stevensville, MT in 1976. Random block design, four replications.

Date Seeded: September 23, 1975    Date Harvested: September 27, 1976  
Size of Plot: 16 sq. ft.

C.I. or State No.	Variety	Yield Bu/a	Test Wt Lbs/Bu	Plant Height	Lodging	
					%	Sev.
MT 6829		56.82	59.1	34.50	2.50b	0.50b
17295	Cardon	61.54	60.4	36.75	33.50	2.25
8385	Cheyenne <sup>3/</sup>	38.83b	57.4	39.00a	30.00	2.25
WA 5826		49.55b	54.7	24.75b	0.00b	0.00b
15317	Franklin	42.70b	55.7	39.75a	0.00b	0.00b
WA 6099		63.29	58.1	27.00b	0.00b	0.00b
ID 0037	Jeff	45.50b	58.9	38.50a	57.50	3.75
17296	Hansel	55.67	60.9	39.75a	40.00	2.75
17298	Peck <sup>3/</sup>	67.06	57.8	33.00	0.00b	0.00b
13968	Nugaines <sup>3/</sup>	61.06	57.9	24.50b	0.00b	0.00b
14586	Luke	51.24b	54.0	24.75b	0.00b	0.00b
14564	Hyslop	40.20b	54.6	26.25b	0.00b	0.00b
OR 7147		54.27	56.5	28.75b	0.00b	0.00b
14485	Paha <sup>3/</sup>	45.57b	56.4	26.25b	0.00b	0.00b
13830	Crest <sup>1/</sup>	61.79	60.0	33.50	38.75	3.00
15376	Sprague <sup>3/</sup>	65.76	58.9	28.25b	0.00b	0.00b
	$\bar{x}$	53.81	57.6	31.58	12.64	0.92
	F <sup>2/</sup>	4.33**	0.0	18.84**	3.86**	7.12**
	S.E. $\bar{x}$	44.61	0.0	1.35	10.08	0.52
	L.S.D. (.05)	12.67	0.0	3.85	28.64	1.47
	C.V. %	8.29	0.0	4.29	79.71	56.13

1/ Check variety

2/ Value for variety comparison

3/ Some smut balls found

\* Indicates statistical significance at the .05 level

\*\* Indicates statistical significance at the .01 level

a/ Values significantly greater than the check (.05)

b/ Values significantly less than the check (.05)



Table 6. Agronomic data from the off station winter wheat nursery grown in Sanders County on the Jack Marranin farm, Perma, MT in 1976. Random block design four replications.

Date seeded: September 23, 1975      Date harvested: August 10, 1976  
 Size of plot: 16 sq. ft.

C.I. or State No.	Variety	Yield Bu/A	Test Wt Lbs/Bu	Plant Height	Lodging	
					%	Sev.
MT 6829		17.80	-	18.50	76.75	1.25
17295	Cardon	12.15	-	17.75	0.00	0.00
8885	Cheyenne	20.20a	-	17.75	52.00	1.25
WA 5826		12.63	-	14.75	0.00	0.00
15317	Franklin	15.50	-	19.25	49.50	0.50
WA 6099		22.48a	59.4	16.50	74.25	0.75
ID 0037	Jeff	20.68a	-	20.00a	24.75	0.25
17296	Hansel	13.93	-	22.50a	53.25	1.25
17298	Peck	17.45	-	16.25	24.75	0.25
13968	Mugaines	12.23	-	16.75	0.00	0.00
14586	Luke	14.75	-	18.75	13.75	4.25a
14564	Hyslop	21.95a	58.5	18.75	74.25	0.75
OR 7147		17.63	-	14.00	0.00	0.00
14485	Paha <sup>1/</sup>	16.10	-	15.75	0.00	0.00
13880	Crest <sup>1/</sup>	13.25	-	16.75	49.50	0.50
15376	Sprague	13.98	-	18.00	16.25	3.50a
	$\bar{x}$	16.41	59.0	17.63	31.81	0.91
	F <sup>2/</sup>	2.67*	0.0	4.06**	2.28*	13.61**
	S.E. $\bar{x}$	21.22	0.0	1.03	19.37	0.34
	L.S.D. (.05)	6.03	0.0	2.94	55.05	0.97
	C.V. %	12.93	0.0	5.86	60.88	37.52

<sup>1/</sup> Check variety

<sup>2/</sup> Value for variety comparison

\* Indicates statistical significance at the .05 level

\*\* Indicates statistical significance at the .01 level

<sup>a/</sup> Values significantly greater than the check (.05)

<sup>b/</sup> Values significantly less than the check (.05)