

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 7. Agronomic data from the Western Regional White Winter Wheat Nursery grown at the Northwestern Agricultural Research Center, Kalispell, MT in 1976. Random block design, four replications.
Date Seeded: September 22, 1975 Date Harvested: August 13, 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		Leaf Rust %	Stripe Rust	
						%	Sev.		Prev. %	Sev. 3/
CI 14565	McDermid	93.28a	57.10	165.25	33.25	74.25a	.75	1.25	2.50	1.50
WA 6099	WA4877/VB66336	92.83a	59.30	165.25	33.75	.00	.00b	2.50	.00	.00
OR 68007	Yamhill/Hyslop	92.13a	57.70	169.50a	36.50a	.00	.00b	.00	.00	.00
OR 67237	CD/101//55-1744/3/DC	89.85a	58.80	167.00	34.25a	24.75	.25	1.25	1.25	.75
WA 6156	71R261/Aline CI 13438	89.23	59.60	163.50b	37.25a	76.75a	1.50	2.50	2.50	1.25
ID 755312	WA 4765//Burt/PI 178383	88.43	56.30	165.50	35.75a	27.25	1.00	.00	.00	.00
CI 14564	Hyslop	87.65	58.40	166.00	32.00	.00	.00b	.00	1.25	.75
ID 755314	WA 4765//Burt/PI 178383	86.53	60.70	168.25a	42.50a	7.50	2.00	1.25	1.25	.25
WA 6241	VH 66354/WA 5827	84.63	55.00	168.75a	30.75b	50.75	1.25	3.75	.00	.00
OR 739401	Oregon Sel. R73-9401	83.80	55.20	166.50	33.00	24.75	.25	2.50	2.50	1.75
WA 6242	Luke//Itana/CI 13431	83.23	58.80	166.25	33.50	74.25a	.75	2.50	3.75	2.25
OR 65116	Nord Desprez/Sel. 101	82.13	57.10	164.25b	33.25	.00	.00b	2.50	2.50	1.50
CI 13968	Nugaines ¹	80.15	59.40	166.50	32.50	7.50	1.50	5.00	2.50	1.50
CI 15376	Sprague	79.83	55.40	166.00	37.25a	76.00a	7.75a	7.50	1.25	1.00
WA 6240	VD 68245/Luke	79.48	57.00	170.50a	32.25	53.25	1.25	.00	1.25	.50
CI 17294	Rew	78.80	59.90	168.25a	40.00a	31.00	2.50	5.00	2.50	1.75
WA 6238	CI 13749/Omar//Delos	76.93	57.90	165.25	35.75a	7.50	4.00a	10.00	10.00	4.00a
OR 7141	CI 13748/Moro, Sel. 38	76.30	56.60	164.25b	35.75a	13.75	4.00a	6.25	5.00	1.25
OR 7138	OM/CI 13749, Sel. 3862	75.62	59.50	167.00	36.50a	54.50a	2.00	3.75	15.00a	4.50a
CI 14485	Paha	75.37	57.40	166.75	36.75a	29.75	2.25	6.25	22.50a	4.25a
OR 7388	27-15//R-R/3/EG/4/13748	75.20	58.30	168.75a	37.50a	29.75	1.75	3.75	5.00	3.25
OR 7147	C.I. 13748/Moro, 905	74.87	55.40	165.75	34.50a	12.50	4.00a	7.50	.00	.00
OR 7142	C. I. 13748/Moro, 142	74.12	57.90	165.75	36.25a	13.75	3.25a	6.25	2.50	1.50
OR 67205	Cap. Desp./Sel. 101//DRV	72.77	53.90	170.00a	29.00b	.00	.00b	1.25	3.75	1.25
CI 13740	Moro	69.80b	57.50	167.50	42.00a	22.50	4.50a	5.00	.00	.00
WA 6155	13431/7805/13447/3*Omar	68.27b	55.50	168.75a	34.50a	34.75	2.50	5.00	7.50	1.75
CI 11755	Elgin	67.60b	60.20	168.25a	42.00a	7.50	3.00a	5.00	6.25	4.00a
CI 1442	Kharkof	61.05b	60.60	164.50b	46.00a	50.00	4.00a	3.75	10.00	3.50
	\bar{x}	80.00	57.73	166.78	35.87	28.72	2.00	3.62	4.02	1.57
	F ₂	6.42**	.00	14.07**	46.53**	2.43**	15.27**	1.60*	1.87*	3.26**
	S.E. \bar{x}	3.27	.00	.49	.56	16.40	.47	2.05	3.74	.79
	L.S.D. (.05)	9.19	.00	1.38	1.58	46.13	1.32	5.78	10.51	2.21
	C.V. %	4.08	.00	.29	1.57	57.09	23.41	56.83	93.00	50.02

Table 7. (con't)

- 1/ Check variety
- 2/ 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
- 3/ Rate 0-9

Table 8. Summary for yields for the Western Regional White Winter Wheat Nursery grown at the Northwestern Agricultural Research Center, Kalispell, MT. 1967-76

C.I. or State No.	Variety	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	Ave.	Sta. Yrs.	% Nugaines
CI 1442	Kharkof	47.4	58.5	58.9	56.4	62.1	59.7	45.3	27.7	37.4	61.1	51.5	10	70
CI 11755	Elgin	49.6	80.5	51.2	74.1	73.0	70.8	50.9	59.2	42.3	67.6	61.9	10	84
CI 13740	Moro	57.2	86.3	65.7	75.4	68.3	68.5	65.6	60.3	44.0	69.8	66.1	10	89
CI 13968	Nugaines	58.7	85.8	63.2	77.6	102.8	73.0	68.5	77.9	51.0	80.2	73.9	10	100
CI 14485	Paha		90.1	65.4	87.0	101.2	88.9	71.1	95.0	55.6	75.4	82.0	9	108
CI 14564	Hyslop		90.1	62.7	87.3	113.1	90.1	63.1	96.3	56.8	87.7	83.0	9	110
CI 14565	McDermid				88.8	111.9	95.8	63.4	84.7	57.1	93.3	85.0	7	112
OR 67205	Cap. Desp./Sel. 101// DRV							63.3	100.0	56.0	72.8	73.0	4	105
OR 65116	Nord Desprez/Sel 101							61.6	81.2	52.3	82.1	69.3	4	100
WA 6099	WA4877/VB66336								89.0	50.3	92.8	79.4	3	113
OR 7147	C.I. 13748/Moro, 905								85.4	53.5	74.9	71.3	3	102
CI 15376	Sprague								81.7	47.5	79.8	69.7	3	100
OR 7142	C.I. 13748/Moro, 142									51.4	74.1	62.8	2	95
CI 17294	Rew									50.4	78.8	64.6	2	98
OR 68007	Yamhill/Hyslop										92.1	92.1	1	115
OR 67237	CD/101//55-1744/3/DC										89.9	89.9	1	112
WA 6156	71R261/Aline CI 13438										89.2	89.2	1	111
ID 755312	WA4765//Burt/PI 178383										88.4	88.4	1	110
ID 755314	WA 4765//Burt/PI 178383										86.5	86.5	1	108
WA 6241	VH 66354/WA 5827										84.6	84.6	1	105
OR 739401	Oregon Sel. R73-9401										83.8	83.8	1	104
WA 6242	Luke//Itana/CI 13431										83.2	83.2	1	104
WA 6240	VD 68245/Luke										79.5	79.5	1	99
WA 6238	CI 13749/Omar//Delos										76.9	76.9	1	96
OR 7141	CI 13748/Moro, Sel. 38										76.3	76.3	1	95
OR 7138	OM/CI 13749, Sel. 3862										75.6	75.6	1	94
OR 7388	27-15//R-R/3/EG/4/13748										75.2	75.2	1	94
WA 6155	13431/7805/13447/3*Omar										68.3	68.3	1	85

Table 9. Agronomic data from the Western Regional White Winter Wheat Nursery grown on the Lance Claridge farm, Kalispell, Montana in 1976. Random block design, four replications.

Date seeded: September 24, 1975 Size of Plot: 16 sq. ft.
Date harvested: September 1, 1976

C.I. or State No.	Variety	Yield Bu/A	Test Wt Lbs/Bu	Plant Height	Lodging		Dwarf Smut %
					%	Sev.	
WA 6240	VD 68245/Luke	57.44a	57.00	27.00	.00	.00	1.75b
OR 7138	OM/CI13749, Sel. 3862	52.04a	58.20	28.25	.00	.00	23.75
CI 15376	Sprague	51.97a	57.60	27.50	33.50	2.50a	.50b
CI 14565	McDermid	51.87a	55.60	28.00	52.00	1.00	11.50
OR 7142	C.I. 13748/Moro, 142	50.47a	57.80	27.50	26.00	1.00	10.25
CI 13740	Moro	50.24a	56.50	32.75a	49.50	2.50a	1.25b
OR 739401	Oregon Sel. R73-9401	48.89	57.50	27.50	.00	.00	16.25
ID 755314	WA 4765//Burt/PI 178383	48.52	57.50	34.00a	74.25	.75	1.75b
WA 6241	VH 66354/WA 5827	48.19	55.60	26.50	74.25	.75	13.75
OR 7388	27-15//R-R/3/EG/4/13748	47.54	58.00	28.75	.00	.00	15.00
OR 65116	Nord Desprez/Sel. 101	47.29	57.20	28.00	49.50	.50	17.50
CI 14564	Hyslop	47.24	57.10	26.50	74.25	.75	16.25
OR 68007	Yamhill/Hyslop	46.44	56.10	29.00a	.00	.00	16.25
WA 6155	13431/7805/13447/3*Omar	46.39	56.60	25.75	24.75	.25	20.00
ID 755312	WA 4765//Burt/PI 178383	46.27	57.70	29.00a	74.25	.75	3.00b
OR 7141	CI 13748/Moro, Sel. 38	45.39	57.50	27.50	24.75	.25	5.25b
OR 7147	C.I. 13748/Moro, 905	45.21	56.70	26.50	.00	.00	4.00b
OR 67237	CD/101//55-1744/3/DC	45.14	56.20	28.75	74.25	.75	25.00
WA 6242	Luke//Itana/CI 13431	43.51	57.20	26.50	49.50	.50	2.75b
OR 67205	CAP. Desp./Sel. 101//Drv	43.14	56.30	24.75	.00	.00	15.00
WA 6099	WA4877/VB66336	42.81	59.50	28.00	.00	.00	9.00
CI 14485	Paha	42.69	57.10	30.25a	49.50	.50	22.50
WA 6238	CI 13749/Omar//Delos	41.26	56.50	28.50	24.75	.25	27.50
CI 13968	Mugaines ^{1/}	40.36	59.10	26.00	49.50	.50	18.75
WA 6156	71R261/Aline CI 13438	39.31	57.50	28.50	99.00	1.00	25.00
CI 1442	Kharkof	39.14	59.50	35.50a	17.50	3.00a	17.50
CI 11755	Elgin	35.44	56.70	33.00a	24.75	.25	31.25a
CI 17294	Rew	32.26	58.20	31.75a	52.00	1.00	27.50
	\bar{x}_2	45.59	57.29	28.62	35.63	.67	14.28
	F ₂ / ^{2/}	2.91**	.00	6.13**	2.15**	2.66**	4.93**
	S.E. \bar{x}	3.15	.00	1.05	20.34	.49	4.14
	L.S.D. (.05)	8.86	.00	2.95	57.23	1.37	11.65
	C.V. %	6.91	.00	3.67	57.09	72.70	29.01

1/ Check variety

2/ 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 10. Summary of agronomic data from the Western Regional White Winter Wheat Nursery grown at the Northwestern Agricultural Research Center and Stillwater in 1976.

C.I. or State No.	Variety	Yield ^{1/} Bu/A ^{1/}	Test Wt. ^{1/} Lbs/Bu ^{1/}	Heading Date ^{2/}	Plant ^{1/} Height	Lodging ^{1/} % Sev.	% Dwarf ^{3/} Smut ^{3/}
CI 14565	McDermid	72.58	56.35	165.25	30.63	63.63 0.88	11.50
WA 6099	WA4877/VB66336	67.82	59.40	165.25	30.88	0.00 0.00	9.00
OR 68007	Yamhill/Hyslop	69.29	56.90	169.50a	32.75	0.00 0.00	16.25
OR 67237	CD/101//55-1744/3/DC	67.50	57.50	167.00	31.50	49.50 0.50	25.00
WA 6156	71R26a/Aline CI13438	64.27	58.55	163.50b	32.88	87.88 1.25	25.00
ID 755312	WA4765//Burt/PI 178383	67.35	57.00	165.50	32.38	50.75 0.88	3.00b
CI 14564	Hyslop	67.45	57.75	166.00	29.25	37.13 0.38	16.25
ID 755314	WA4765//Burt/PI178383	67.53	59.10	168.25a	38.25	40.88 1.38	1.75b
WA 6241	VH 66354/WA 5827	66.41	55.30	168.75a	28.63	62.50 1.00	13.75
OR 739401	Oregon Sel. R73-9401	66.35	56.35	166.50	30.25	12.38 0.13	16.25
WA 6242	Luke//Itana/CI13431	63.37	58.00	166.25	30.00	61.88 0.63	2.75b
OR 65116	Nord Desprez/Sel. 101	64.71	57.15	164.25b	30.63	24.75 0.25	17.50
CI 13968	Nugaines ^{4/}	60.26	59.25	166.50	29.25	28.50 1.00	18.75
CI 15376	Sprague	65.90	56.50	166.00	32.38	54.75 5.13	0.50b
WA 6240	VD68245/Luke	68.46	57.00	170.50a	29.63	26.63 0.63	1.75b
CI 17294	Rew	55.53	59.05	168.25a	35.88	41.50 1.75	27.50
WA 6238	CI 13749/Omar//Delos	59.10	57.20	165.25	32.13	16.13 2.13	27.50
OR 7141	CI13748/Moro, Sel. 38	60.85	57.05	164.25b	31.63	19.25 2.13	5.25b
OR 7138	OM/CI13749, Sel. 3862	63.83	58.85	167.00	32.38	27.25 1.00	23.75
CI 14485	Paha	59.03	57.25	166.75	33.50	39.63 1.38	22.50
OR 7388	27-15//R-R/3/EG/4/13748	61.37	58.15	168.75a	33.13	14.88 0.88	15.00
OR 7147	CI13748/Moro, 905	60.04	56.05	165.75	30.50	6.25 2.00	4.00b
OR 7142	CI13748/Moro, 142	62.31	57.85	165.75	31.88	19.88 2.13	10.25
OR 67205	Cap. Desp./Sell101//DRV	57.96	55.10	170.00a	26.88	0.00 0.00	15.00
CI 13740	Moro	60.02	57.00	167.50	37.38	36.00 3.50	1.25b
WA 6155	13431/7805/13447/3*Omar	57.33	56.05	168.75a	30.13	29.75 1.38	20.00
CI 11755	Elgin	51.52	58.45	168.25a	37.50	16.13 1.63	31.25a
CI 1442	Kharkof	50.10	60.05	164.50b	40.75	33.75 3.50	17.50

1/ \bar{x} for Northwestern Agricultural Research Center and Stillwater

2/ \bar{x} for Northwestern Agricultural Research Center only

3/ \bar{x} for Stillwater only

4/ Check variety

a/ Value significantly greater than check (.05)

b/ Value significantly less than check (.05)