

TITLE: Winter Wheat  
PROJECT: Small Grains Investigations MS 756  
YEAR: 1975  
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.

1975 EXPERIMENTS:

1. Western Regional Hard Red Winter Nursery
2. Off Station Nurseries
3. Western Regional White Winter Nursery
4. Crest Line Row Yield Nursery
5. Breeding Material

SUMMARY OF 1975 RESULTS:

Western Regional Hard Red Winter Nursery -

Kalispell - The nursery's yields and test weights were lower than that of last year. This was probably brought about by the hot, dry weather in July. Four entries' yields were significantly greater than the check, Crest. One entry had a yield significantly less than Crest.

Lodging was less severe than last year. There was a lodging severity of 7.88 last year compared to 3.19 this year.

There were six entries that had a significantly greater amount of dwarf smut than Crest. ID 92, one of the high yielding entries had no dwarf smut. Nine other entries also had no dwarf smut. Because of the low level of dwarf smut in susceptible varieties, those entries with low readings could, in fact, be escapes and one could not conclude that they are resistant lines from these data. Table 1.

Stillwater - The nursery at Stillwater had to be abandoned this year because of an extremely poor stand. Most entries failed to come up due to dry soil conditions.

Off Station Nurseries - Four off station nurseries were planted in the fall of 1974. Two were harvested and are reported below. The nursery in Sanders County had to be abandoned because of hail damage.

The nursery in Missoula County was abandoned because of its irregular growth. It is thought that this irregularity was caused by a herbicide injury.

Summary of 1975 Results (con't)

Lake County - Yield data was found to be non-significant. Yields and test weights ran low this year. McDermid was the highest yielding entry at 31.4 bu/a and the lowest was Paha at 13.3 bu/a. Five test weights were unobtainable because of insufficient amounts of grain. Table 2.

Ravalli County - Yields and test weights tend to be low this year. Nugaines was the only entry with a yield significantly less than the check, Crest. No yields were significantly greater than Crest. Five test weights were unobtainable because of insufficient amounts of grain. Sprague and Luke were the only two entries who's lodging severity was significantly greater than Crest. Table 3.

Western Regional White Winter Nursery - The hot, dry weather in July contributed greatly to the nursery's over all low yields, a mean of 49.73 bu/a and low test weights, a mean of 54.63 lb/bu this year. No entries were found to have yields or test weights significantly greater than the check, Nugaines. Five entries had yields significantly less than Nugaines.

Dwarf smut was not observed in three entries this year. The entries were Moro, WA 5826 and WA 6145. Stripe rust readings were not obtained this year. Table 4.

Using Nugaines as a check variety for several years, nine varieties have shown yields superior to Nugaines. WA 6145 exceeded Nugaines in yield and has good dwarf smut resistance. McDermid, OR 67205, and OR 7147 exceeded Nugaines in yield and have shown some resistance to dwarf smut. The other high yielding entries haven't shown substantial amounts of resistance to dwarf smut. Table 5.

Crest Line Row Yield Nursery - Table 6, gives yield data from several selections from the variety Crest. The F test for the lines was non-significant for yield. Significant differences were noted for heading date, plant height and lodging readings.

Breeding Material - Allan Taylor selected dwarf smut free plants and our staff harvested and threshed the seed. This was sent to Taylor for his use in the breeding program.

## WINTER WHEAT VARIETIES

WINTER WHEAT VARIETIES RECOMMENDED FOR WESTERN MONTANAHard Red Varieties

1. Crest
2. Winalta
3. Cheyenne

Soft White Varieties

1. Nugaines
2. Luke

CHARACTERISTICS OF RECOMMENDED VARIETIES

1. Crest
  - a. Bearded Variety, developed in Montana
  - b. High yielding potential in dwarf smut and stripe rust areas
  - c. Tall type
  - d. Maturity - early to mid-season
  - e. Good test weight
  - f. Weak straw strength
  - g. Moderate shattering resistance
  - h. Resistant to stripe rust and dwarf smut
  - i. Susceptible to stem rust and sawfly infestation
  - j. Not extremely winter hardy
  - k. Adequate baking and milling quality
2. Winalta
  - a. Bearded variety
  - b. Fair yielding
  - c. Tall type
  - d. Maturity - early to mid-season
  - e. Good test weight
  - f. Weak straw strength
  - g. Good shattering resistance
  - h. Susceptible to dwarf smut and sawfly infestations
  - i. Resistant to stripe rust
  - j. Moderate resistance to stem rust
3. Cheyenne
  - a. Bearded variety
  - b. Good yielding ability
  - c. Tall type
  - d. Maturity - early to mid-season
  - e. Good test weight
  - f. Weak straw strength
  - g. Susceptible to shattering
  - h. Moderate resistance to stripe rust
  - i. Susceptible to dwarf smut, stem rust and sawfly infestation
  - j. Good milling and baking qualities

Recommended Varieties (con't)Soft White Varieties

1. Nugaines
  - a. Bearded variety
  - b. Good yielding ability
  - c. Semi-dwarf type
  - d. Maturity - mid-season
  - e. Good test weight
  - f. Very strong straw strength
  - g. Resistant to shattering
  - h. Resistant to stripe rust
  - i. Susceptible to dwarf smut
  - j. Good baking and milling quality for cake flours
  
2. Luke
  - a. Bearded variety
  - b. Good yielding ability
  - c. Semi-dwarf type
  - d. Maturity - mid-season
  - e. Fair test weight
  - f. Poor to fair straw strength
  - g. Resistant to shattering
  - h. Resistant to dwarf smut and stripe rust
  - i. Foot rot tolerant
  - j. Good baking and milling quality for cake flours

Table 4. Agronomic data from the western regional white winter wheat nursery grown at Kalispell, Montana in 1975. Random block design. Four replications. Field E-1.

Date seeded: September 19, 1974      Date harvested: August 12, 1975      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
						Prev.	Sev.	
CI 14565	McDermid	57.12	53.00	169.25b	33.25	16.25	2.75	.50
CI 14564	Hyslop	56.82	53.20	170.50b	32.50	54.50a	1.50	.75
OR 7146	C.I. 13748/Moro,826	56.69	54.90	170.00b	34.25a	12.50	3.50a	.50
WA 6099	WA4877/VB66336	56.34	55.20	170.75b	33.50	76.75a	1.25b	1.25
OR 67205	CAP. DESP./SEL. 101//DRV	55.99	52.00	170.75b	29.25b	99.00a	1.00b	.50
CI 14485	Paha	55.64	55.50	172.00	36.75a	15.00	2.25	1.00
OR 7147	C.I. 13748/Moro, 905	53.52	51.60	170.00b	34.75a	10.00	3.00	.50
OR 65116	Nord Desprez/Sel. 101	52.32	52.10	169.75b	32.00	99.00a	1.00b	.75
WA 6145	WA3969//178383/CI 13431	52.29	55.90	171.75	31.75	54.50a	1.50	.00
CI 13968	Nugaines <sup>1/</sup>	51.79	56.60	172.00	32.00	12.50	2.25	1.75
WA 5988	Gaines//178383/CI 13431	51.77	54.00	172.00	33.00	34.75	2.00	.50
OR 7142	C.I. 13748/Moro,142	51.39	53.40	170.00b	38.50a	22.50	4.75a	.25
CI 17294	Rew	50.44	56.00	172.50	40.75a	20.00	2.75	6.25a
SS 747	CI13431/CI7805/CI13447/3	47.79	53.70	173.50a	31.75	10.00	3.00	3.25
CI 15376	Sprague	47.47	53.20	170.00b	35.50a	70.00a	6.25a	.25
WA 6146	Gaines/Joel//WA 4766	46.52	55.60	172.75	30.00	15.00	2.00	1.25
ID 725057	ID 5011/WA 4765,Sel. 2	46.47	56.50	176.00a	34.25a	54.50a	1.50	1.50
CI 13438	Hybrid71R261/A	45.26	55.40	170.00b	34.25a	13.75	2.50	8.50a
CI 13740	Moro	44.04b	53.40	170.75b	41.50a	27.50	4.25a	.00
WA 5826	OM/1834-3//178383/13431	43.09b	53.40	175.25a	30.25	32.25	1.75	.00
CI 11755	Elgin	42.26b	57.00	173.25a	41.75a	23.75	3.00	16.25a
CI 17298	Peck	41.36b	56.50	174.00a	40.00a	32.25	2.00	1.00
CI 1442	Kharkof	37.44b	58.40	169.25b	43.50a	65.00a	4.00a	10.75a
	$\bar{x}$	49.73	54.63	171.57	35.00	37.88	2.60	2.49
	$F^2/$	5.93**	.00	25.23**	28.59**	4.06**	18.79**	11.21**
	S.E. $\bar{x}$	2.34	.00	.37	.77	13.97	.30	1.23
	L.S.D. (.05)	6.60	.00	1.06	2.16	39.41	.84	3.46
	C.V. %	4.70	.00	.22	2.19	36.89	11.45	49.33

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 5. Summary of yields for western regional white winter wheat nursery grown at the Northwestern Agricultural Research Center, Kalispell, Montana, 1966-75.

C. I. or State No.	Variety	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	Ave.	Sta. Yrs.	% Nugaines
CI 1442	Kharkof	52.1	47.4	58.5	58.9	56.4	62.1	59.7	45.3	27.7	37.4	50.5	10	68
CI 11755	Elgin	52.3	49.6	80.5	51.2	74.1	73.0	70.8	50.9	59.2	42.3	60.4	10	82
CI 13740	Moro	85.9	57.2	86.3	65.7	75.4	68.3	68.5	65.6	60.3	44.0	67.6	10	92
CI 13968	Nugaines	79.7	58.7	85.8	63.2	77.6	102.8	73.0	68.5	77.9	51.8	73.9	10	100
CI 14485	Paha			98.1	65.4	87.0	101.2	88.9	71.1	95.0	55.6	82.8	8	110
CI 14564	Hyslop			90.1	62.7	87.3	113.1	90.1	63.1	96.3	56.8	82.4	8	110
CI 14565	McDermid					88.8	111.9	95.8	63.4	84.7	57.1	83.6	6	111
WA 5826	OM/1834-3//178383/13431							69.4	66.0	91.1	43.1	67.4	4	99
WA 5988	Gaines//178383/CI13431								69.3	84.7	51.8	68.6	3	104
ID 725057	ID5011/WA4765, Sel. 2								67.5	95.1	46.5	69.7	3	105
OR 67205	Cap. Desp./Sel 101//Drv.								63.3	100.0	56.0	73.1	3	110
OR 65116	Nord Desprez/Sel 101								61.6	81.2	52.3	65.0	3	98
WA 6099	WA4877/VB66336									89.0	56.3	72.7	2	112
OR 7147	CI13748/Moro, 905									85.4	53.5	69.5	2	107
CI 15376	Sprague									81.7	47.5	64.6	2	99
OR 7146	CI13748/Moro, 826									73.2	56.7	65.0	2	100
WA 6145	WA3969//178383/CI13431										52.3	52.3	1	101
OR 7142	CI13748/Moro 142										51.4	51.4	1	99
CI 17294	Rew										50.4	50.4	1	97
SS 747	CI13431/CI7805/CI13447/3										47.8	47.8	1	92
WA 6146	Gaines/Joel//WA4766										46.5	46.5	1	90
CI 13438	Hybrid 71R261/A										45.3	45.3	1	87
CI 17298	Peck										41.4	41.4	1	80