

-25-

TITLE: Winter Wheat

PROJECT: Small Grains Investigations 756

PERSONNEL: Leader - Vern R. Stewart
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.

1973 EXPERIMENTS:

1. Western Regional Hard Red Nursery
2. Western Regional White Nursery
3. Intrastate Nursery
4. Elite Stripe Rust Nursery
5. Off Station Nurseries

SUMMARY OF 1973 RESULTS:Western Regional Hard Red Nursery -

Kalispell - ID70401 was the highest yielding entry in the nursery. Mean for all varieties was 45.6 bu/a. Real differences were found in winter survival of entries. ID33 has a survival reading of 29%, WA5985 and UT80702 had survival readings of 66% and 65% respectively. All other entries exceeded 80%. No dwarf smut was found in this nursery. Table 1.

Stillwater - Stand loss was very high and dwarf bunt infestation low in this nursery due to the extremely low temperatures and no snow cover. No percentage estimates were made on smut. Itana, a very susceptible variety, was smut free in this location. Table 2.

Summary of the data from these two nurseries is found in Table 3. UT755090 is the highest yielding entry, no evidence of dwarf smut, good test weight, fair straw, and somewhat later than Itana, but a little taller.

Western Regional Soft White Nursery:

In 1973 WA5987 and Paha were slightly higher, but not significantly higher, in yield than Nugaines, the check variety, however they are 2 to 3 days later in heading. Three entries were found to be significantly lower in yield. Test weights averaged 60.9 lbs/bu with Nugaines having a test weight of 63.2 lbs/bu, which was the highest in the nursery. WA5987 and Paha had less dwarf smut than Nugaines, however light smut has been found in Paha other seasons. Paha was 5 inches taller than Nugaines in this study. Table 4.

Using Nugaines as a check variety over a ten year period, eight varieties were found to exceed the check. Of these varieties only Luke has satisfactory dwarf smut and stripe rust resistance. Table 5.

Results (con't)

Intrastate Nursery -

The highest yielding entry in this nursery was McCall, however it was not significantly higher than Crest, the check variety. McCall, Wanser and Centurk are usually higher in yield but all 3 are susceptible to dwarf smut in this location. Table 6.

A summary of selected winter wheat varieties grown at the Northwestern Agricultural Research Center 1962-1973 are found in Table 7.

Elite Stripe Rust Nursery -

In this nursery lines from the breeding lines in advance stages are evaluated. Many lines were not harvested this year because of milling quality evaluation received after seeding indicated no need to continue their evaluation. The data obtained from this nursery are recorded in the wheat research committee report.

Off Station -

Three nurseries were seeded in the fall of 1972 in Lake, Sanders, Ravalli and Missoula Counties. The nursery in Missoula county was not harvested because of poor stands and high weed population.

Lake County - Because of the very dry conditions yields were low in this location. Yields were not statistically significant, however Hyslop was the highest yielding entry. Table 8.

Sanders County - Stands and yields were average in this location. McCall is the highest yielding variety in the nursery and is significantly higher in yield than Crest. Table 9.

Table 6. Agronomic data from the intrastate winter wheat nursery grown at the Northwestern Agricultural Research Center, Kalispell, Montana in 1973. Field No. E-2. Random block design, Six replications.

Date seeded: September 15, 1972 Harvest Date: August 7, 1973 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 13842	McCall	62.05	60.30	158.33a	37.83a	.00b	.00b	2.83a
CI 15075	Centurk	59.35	62.60	154.50a	35.50a	.00b	.00b	2.33a
CI 13844	Wanser	59.24	62.20	157.17a	38.33a	.00b	.00b	1.17a
MT 7015	NB55-391-64-D4/Wmt 2-1-1	58.65	60.50	160.67a	39.33a	.00b	.00b	.50a
CI 8885	Cheyenne	58.52	62.40	158.17a	41.00a	82.50a	.83	1.00a
CI 13968	Nugaines	58.49	60.00	158.83a	29.50	.00b	.00b	.67a
MT 6715	3Yogo/Cnn 2-3-13-6	57.04	62.00	154.83a	37.33a	33.00	.33	1.00a
CI 13880	Crest	55.62	61.40	152.50	33.00	33.00	.33	.00
CI 13872	Froid	55.58	59.80	159.00a	44.17a	99.00a	2.83a	1.00a
MT 6919	BWH1867-5/YTO-1171-3-2-1	55.05	62.00	157.83a	45.50a	99.00a	4.00a	5.00a
CI 13547	Lancer	54.60	62.00	154.33a	36.83a	.00b	.00b	1.33a
CI 12933	Itana	52.73	62.50	158.83a	42.50a	.00b	.00b	1.50a
CI 13998	Trader	51.85	61.70	157.17a	42.33a	.00b	.00b	1.17a
CI 15244	Teton	51.62	60.70	158.83a	44.33a	99.00a	3.50a	.50a
MT 6930	NB176/Y18181//YTO1174-3	51.32	61.60	159.50a	43.83a	82.50a	1.83a	.83a
MT 6716	3Yogo/Cnn 2-3-17-19	50.23	61.00	159.00a	43.67a	99.00a	3.00a	1.00a
CI 14000	Winoka	50.03	61.30	158.67a	40.83a	66.00a	.67a	1.17a
CI 13442	Delmar	49.58	60.00	160.33a	39.67a	.00b	.00b	.50a
CI 8033	Yogo	49.05	61.70	159.00a	46.17a	99.00a	3.50a	1.00a
MT 7005	Polo/Turg//Wrr 6-3-1	48.73	60.60	158.17a	44.17a	99.00a	2.83a	.50a
CI 13999	Trapper	48.53	63.00	157.83a	41.33a	.00b	.00b	2.00a
MT 6917	Bwh1376-8/YTO-1171-3-2-2	48.47	61.00	159.33a	45.00a	99.00a	3.17a	1.00a
CI 13181	Rego	48.07	60.90	158.00a	44.67a	99.00a	4.33a	1.17a
MT 693	Winalta 41	47.60b	61.10	158.33a	39.83a	33.00	.33	1.17a
CI 13670	Winalta	46.68b	63.00	158.17a	41.17a	.00b	.00b	1.00a
CI 13190	Warrior	46.40b	61.50	156.00a	38.83a	33.00	.33	1.17a
CI 15327	Sundance	46.27b	59.00	163.33a	44.33a	99.00a	3.17a	1.00a
MT 6918	BWH1376-8/YTO-1172-3-2-2	45.18b	61.20	158.33a	43.00a	99.00a	4.17a	1.00a
CI 6938	Kharkof MC22	45.00b	59.00	161.67a	45.17a	99.00a	1.83a	1.17a
MT 6916	BWH1376-8/YTO-1171-3-2-1	43.88b	61.50	159.50a	46.00a	99.00a	3.00a	1.00a
MT 7010	WHT/Ry/A*E/3//WRR 14-2-1	43.25b	59.70	157.83a	42.50a	.00b	.00b	.83a
MT 6920	BWH1867-5/YTO-1171-3-4-1	42.18b	61.00	158.83a	44.17a	99.00a	4.33a	1.17a
CI 14075	Scoutland	41.81b	60.80	150.83a	35.83a	.00b	.00b	1.00a

4
152

Table 6 . (con't)

C.I. or State No.	Variety	Yield	Test Wt.	Heading	Plant	Lodging		Dwarf
		Bu/A.	Lbs/Bu.	Date	Height	% Prev.	Sev.	Smut %
	\bar{x}	50.99	61.18	157.99	41.14	50.00	1.46	1.03
	$F^2/$	4.10**	.00	59.89**	33.73**	25.00**	44.94**	5.7052
	S.E. \bar{x}	2.75	.00	.32	.69	9.17	.25	.233
	L.S.D. (.05)	7.63	.00	.87	1.90	25.41	.68	.07
	C.V.%	5.40	.00	.20	1.67	18.34	16.80	22.68

1/ Check variety

2/ Value for variety comparison

* Indicates statistical significance .05 level

** Indicates statistical significance .01 level

a Values significantly greater than the check .05 level

b Values significantly less than the check .05 level

Table 7. Summary of selected winter wheat varieties grown at the Northwestern Agricultural Research Center, Kalispell, Montana 1964-73.

C.I. or State No.	Variety	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	\bar{x}	Sta. Yrs.	% Cheyenne
CI 8885	Cheyenne	57.5	48.7	59.3	46.4	57.2	57.0	63.7	48.6	67.2	58.5	56.4	10	100.0
CI 13670	Winalta	54.4	31.4	67.4	44.9	55.8	45.7	57.9	55.9	66.6	46.7	52.7	10	93.4
CI 13181	Rego	49.9	42.5	62.4	43.6		51.3	58.7	56.3	54.3	48.1	51.9	9	92.1
CI 13442	Delmar	51.4	47.3	64.2	55.9	67.9	59.3			69.0	49.6	58.1	8	102.8
CI 13844	Wanser			73.9	51.7	76.5	56.0	65.5	59.6	79.7	59.2	65.3	8	114.0
CI 13880	Crest			73.4	53.5	51.6	43.8	69.0	54.1	70.9	55.6	59.0	8	103.1
CI 13842	McCall			56.4	51.9	76.8	40.5	63.3	58.5	68.5	62.1	59.7	8	104.4
CI 13190	Warrior	45.8	37.1	59.5	43.5			60.8	48.3	70.6	46.4	51.5	8	91.6
CI 13547	Lancer			57.0	41.7	44.0	38.3	58.4	42.6	68.1	54.6	50.6	8	88.4
CI 12933	Itana	46.8	38.3	58.2				61.1	53.3	67.9	52.7	54.0	7	93.8
CI 14000	Winoka							57.2	46.3	62.4	50.0	54.0	4	90.7
CI 13998	Trader							54.7	38.8	70.2	51.9	53.9	4	90.6
MT 693	Winalta 41							56.7	44.7	61.2	47.6	52.6	4	1188.3
CI 13999	Trapper							56.6	44.6	58.4	48.5	52.0	4	87.4
CI 13872	Froid							55.5	43.8	59.4	55.6	53.6	4	90.0
CI 8033	Yogo							55.5	48.6	58.4	49.0	52.9	4	88.9
CI 6938	Kharkof Mc22							53.3	36.2	59.5	45.0	48.5	4	81.5
NB 66425	Centurk								46.8	78.6	59.4	61.6	3	106.0
CI 15327	Sundance									53.5	46.3	49.9	2	79.4
MT 7015	NB55-391-64									65.9	58.7	62.3	2	99.1
MT 6715	3Yogo/Cnn2-									53.1	57.0	55.1	2	87.6
MT 6919	BWH 1867-5/YT									51.0	55.1	53.1	2	84.4
MT 6916	BWH 1376-8/YT									58.1	43.9	51.0	2	81.1
MT 6930	NB176/Y18181									50.1	51.3	50.7	2	80.7
MT 7005	Polo/Turg//W									50.8	48.7	49.7	2	79.2
MT 6716	3Yogo/Cnn2									49.2	50.2	49.7	2	79.1
MT 6918	BWH1376-8/YT									53.2	45.2	49.2	2	78.3
MT 6917	BWH1376-8/YT									49.1	48.5	48.8	2	77.6
MT 7010	WHT/RV/A*E/3									53.3	43.2	48.3	2	76.8
MT 6920	BWH1867-5/YT									45.3	42.2	43.8	2	69.6
CI 15244	Teton										51.6	51.6	1	88.2
CI 14075	Scoutland										41.8	41.8	1	71.5

-34-

Table 8 . Agronomic data from off station winter wheat nursery grown in Lake County on the Wolen Johnson farm, Charlo, Montana in 1973. Random block design, four replications.

Date Seeded: September 27, 1972
Date Harvested: August 1, 1973
Size of Plot: 16 sq. ft.

C.I. or State No.	Variety	Yield Bu/A.	Test Wt. Lbs/Bu.	Plant Height	% Stand
CI 14564	Hyslop	37.94	59.50	22.25	80.0
CI 14586	Luke	34.86	61.00	21.00	85.0
CI 13844	Wanser	31.41	61.00	21.50	70.0
CI 13842	McCall	31.11	61.00	23.50 ^a	72.5
CI 14565	Nord Desprez/2*Sel 101	30.99	58.50	19.00	76.3
CI 13880	Crest ^{1/}	28.31	60.50	20.00	86.2
CI 8885	Cheyenne	26.76	61.50	22.50	67.5
CI 14485	Paha	26.71	60.50	17.25	72.5
MT 6827	Burt/PI178383 14-1202	26.18	58.50	22.75	70.0
CI 13670	Winalta	25.68	60.50	22.25	77.5
MT 6826	Burt/PI 178383 4-1192	25.33	58.50	21.25	67.5
MT 6829	Burt/PI 178383 101-1200	24.83	61.00	23.50 ^a	63.8
CI 13442	Delmar	22.78	59.00	23.75 ^a	65.0
CI 13968	Nugaines	22.58	60.00	18.00	66.2
WA 5829	S.Helvia//Suwon92/13645	22.13	59.00	18.50	72.5
CI 14483	Coulee	21.76	59.50	17.75	67.5

\bar{x}	27.5	60.0	20.9	72.0
$F_{2/}$	1.53NS	.0	3.32**	1.08NS
S.E. \bar{x}	7.6	.0	2.4	1.3
L.S.D.(.05)	10.80	.0	3.46	18.7
C.V.%	13.81	.0	5.81	9.06

^{1/} Check variety
^{2/} Value for variety comparison
** Indicates statistical significance at .01 level
NS No statistical significance
a Values significantly greater than the check .05 level

Table 9. Agronomic data from the off station winter wheat nursery grown in Sanders County on the Jack Marrinan farm, Hot Springs, Montana in 1973. Experimental Block Design, four replications.

Date Seeded: September 17, 1972
Date Harvested: August 1, 1973
Size of Plot: 16 sq. ft.

C.I. or State No.	Variety	Yield Bu/A.	Plant Height	% Stand
CI 13842	McCall	19.31a	20.00a	70.0
CI 14565	Nord Desprez/2*Sel.101	19.16a	19.50	60.0
CI 13844	Wanser	18.73a	21.25	55.0b
CI 8885	Cheyenne	18.43a	19.50	60.0
MT 6827	Burt/PI 178383 14-1202	18.31a	18.50	57.5
CI 14564	Hyslop	17.58a	20.00	60.0
MT 6829	Burt/PI178383 101-1200	17.36	20.25	62.5
CI 14586	Luke	15.68	19.00	70.0
MT 6826	Burt/PI 178383 4-1192	15.26	16.75	60.0
WA 5829	S.Helvia//Suwon92/13645	14.75	17.00	60.0
CI 13670	Winalta	14.30	19.25	67.5
CI 14485	Paha ^{1/}	13.68	19.00	62.5
CI 13880	Crest ^{1/}	13.05	17.50	65.0
CI 13968	Nugaines	12.93	16.00	60.0
CI 14483	Coulee	12.45	17.50	52.5b
CI 13442	Delmar	11.83	18.75	57.5
	\bar{x}	15.8	18.7	61.0
	F _{2/}	2.86*	3.18**	2.05*
	S.E. \bar{x}	1.54	.81	.34
	L.S.D.(.05)	4.39	2.29	9.8
	C.V.%	9.76	4.30	5.61

1/ Check variety

2/ Value for variety comparison

* Indicates statistical significance .05 level

** Indicates statistical significance .01 level

a Values significantly greater than the check .05 level

b Values significantly less than the check .05 level