

TITLE: Winter Wheat

PROJECT: Small Grains Investigations MS 756

YEAR: 1969

PERSONNEL: Leader- Vern R. Stewart
Cooperator - G. A. Taylor

LOCATION: Northwestern Montana Branch Station and several off station locations throughout western Montana which will be identified in the manuscript.

DURATION: Indefinite

OBJECTIVES:

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

SIGNIFICANT FINDINGS:

1. Burt x P.I. 178383 lines are highly resistant to dwarf smut and stripe rust.
2. Moro and Omar x P.I. 178383 are white wheats which have a high degree of resistance to stripe rust and dwarf smut.
3. Nugaines and Moro were the highest yielding varieties in all studies in western Montana. Wanser was the highest yielding hard red entry, but very susceptible to dwarf smut.

FUTURE PLANS: Plans for 1969-70 include regular yield nurseries and assistance in the overall state breeding program.

MATERIALS AND METHODS:

Standard nursery procedures were used in all of the variety testing programs. A randomized block design was used having four to six replications. Data obtained were: yield; plant height; test weight; disease and lodging. Nurseries grown were: Intrastate Winter Wheat Nursery at the Northwestern Montana Branch Station in Field E-3; Western Regional Hard Red Winter Wheat Nursery grown on the L. B. Claridge farm, northwest of Kalispell in a dwarf bunt area; Uniform White Wheat Nursery grown at the Northwestern Montana Branch Station in Field E-3. The off station nurseries were located in Ravalli, Missoula, Lake, Sanders and Mineral Counties.

Herbicide applications were made for weed control in all winter wheat studies early in the spring. Bromoxynil was used at the rate of 3/8 lb ai/a.

Plots were harvested with a power harvester.

RESULTS AND DISCUSSIONS:Intrastate Hard Red Winter Wheat Nursery

The yield data from this nursery were non-significant when analyzed statistically. The high coefficient of variability is due in part to bird damage, uneven soil conditions and variation of stripe rust between replications which is a direct relationship to the soil variation.

Dwarf smut readings were high in the varieties of Lancer, McCall, Winalta, Westmont, Wanser, MT 6832, Rego, Cheyenne, MT 6830 and MT 6641. Some of the fore named varieties also had a high incidence of stripe rust. The Burt x P.I. 178383 lines were the top yielding entries, had excellent dwarf bunt resistance and generally good stripe rust resistance. Table 1, gives complete detail of this test.

In table 2 a summary of data is given for varieties grown in the above named nursery. Two varieties, Cheyenne and Westmont have been grown for ten years. Using Westmont as a standard, Cheyenne is 20% higher in yield over the 10 years 1960-69. Of the named varieties, four year averages, Wanser (64.5 bu/a) is high in yield followed by Delmar (61.8 bu/a), McCall (56.4), and Crest 55.6 bu/a). McCall and Wanser both have a high susceptibility to dwarf smut in this location.

Western Regional Hard Red Winter Nursery

A seeding date of October 1, 1969 resulted in loss of stand and low tillering in this nursery. Only three of the four replications was harvested because of almost total loss of the fourth replication. To obtain optimum stand in this area, seeding should be completed by not later than September 20, with September 15 being the best seeding date for highest yields.

Yields were non-significant, however UT 646001 was the highest yielding entry. This variety also had the highest stand count at harvest time. The mean for the nursery was 41.3 bu/a.

Dwarf smut was very light this season on the Claridge farm. This in contrast to what we usually expect in this area with a late date of planting. (Oct. 1, 1969) Readings were not obtained for entries because of an error in recording at the time the notes were taken. Table 4. all

Uniform White Wheat Nursery

Soil and moisture conditions were the same for this nursery as described above for the Intrastate hard red winter wheat nursery. Yield data were non-significant. Significant differences were found in stripe rust and dwarf bunt levels in the nursery. Nugaines, the check variety, had a high level of both stripe rust and dwarf bunt. Moro and a sister selection showed good resistance to both diseases in this nursery. Table 5 gives complete tabulation of all data obtained in 1969.

A summary of the Uniform White Wheat Nursery is given in Table 6. This shows five varieties being greater in yield than Gaines which is used as a standard. Some of the comparisons are for only one year thus one should not make a firm judgement on this limited amount of data. WA 4966 and WA 4995 have good yield level, but the dwarf smut level is too high to be acceptable as a commercial variety in this area.

Table 3. Agronomic data from the western regional hard red winter wheat nursery grown on the L. B. Claridge farm, Kalispell, Montana in 1969. Experimental design - random block, three replications.

Planting date: October 1, 1968 Harvest Date: September 6, 1969 Size of plot: 16 square feet

CI or State No.	Variety	Yield Bu/A	Test Wt. Lbs/Bu.	Days Jan.1 to Heading	Plant Height	Lodging		% Stand
						% Prev.	Sev. 0-9	
UT 646001	Delmar/Columbia	51.1	62.6	168	35.7	96.0	6.0	94.7
MT 6319	Sel Bulk 2-77	49.5	59.1	171	37.7	86.0	6.3	83.3
CI 8885	Cheyenne	49.0	59.8	169	37.0	68.3	7.0	76.7
WA 4836	Bezostaja 2/ Sel.B	47.0	60.0	167	32.0	2.0	6.0	80.0
CI 1442	Kharkof	47.0	60.0	168	43.3	99.0	7.0	91.7
ID 0001	At150 (Rio-Rex//2Cnn)/4Tk	45.2	59.6	169	35.3	23.3	7.0	75.0
CI 13426	Tendoy	45.1	59.4	170	37.3	60.0	8.0	88.3
ID 5001	(Rex-Rio x6 Cnn)XA.F. Tk	43.8	59.8	168	39.0	59.7	4.7	83.0
MT 6531	Rego x Cnn 37-3-6	43.8	59.4	168	41.7	73.0	7.0	91.3
UT 522001	Utah 175A-53/Delmar	43.3	60.8	170	40.0	94.3	6.7	91.3
ID 5006	Nrn10/Staring //2 Cnn	42.4	62.0	172	25.7	0.0	0.0	83.3
ID 0007	Cheyenne/Utah 175A-53	41.4	58.6	170	34.7	50.0	8.3	85.0
CI 13842	McCall	40.8	61.0	171	35.7	16.7	8.7	84.7
ID 0002	Orfed/Wsc//Burt	40.7	60.5	169	34.0	46.7	8.0	81.7
ID 0010	Cnn x Utah 175A-53	40.7	0.0	170	38.0	69.7	4.0	88.0
CI 13846	Itana 65	40.5	61.5	170	35.3	70.0	7.3	81.7
ID 0009	Cheyenne/Utah 175A-53	39.7	59.3	169	36.0	38.3	5.3	88.3
CI 13844	Wanser	38.4	59.0	169	36.0	8.3	9.0	66.7
ID 0008	Cheyenne/Utah 175A-53	36.9	60.6	171	39.7	73.3	6.7	76.7
MT 6641	PI 178383 x2 Wmt, 16-1-8	35.0	60.5	170	34.3	61.7	6.7	81.3
CI 10061	Rio	34.0	56.6	170	33.3	73.0	8.3	73.3
CI 13442	Delmar ^{1/}	32.9	59.0	172	39.0	16.7	7.7	68.3
CI 13880	Crest	32.3	60.9	170	22.0	61.3	5.3	73.3
CI 12933	Itana	31.3	60.4	170	36.3	13.3	7.3	73.3

^{1/} Delmar is the check variety

\bar{x}	41.3	60.0	170	35.8	52.5	6.6	81.7
F - Value for variety comparison	1.00	0.0	1.09	3.07*	5.22*	3.43*	.78
\overline{SEx}	5.5	0.0	11.4	2.6	13.5	1.0	8.6
L.S.D.	N.S.	0.0	N.S.	7.43	38.49	2.89	24.56
C.V.%	13.28	0.0	6.83	7.26	25.64	15.35	10.52

-27-

Ks
VRS

Table 4. Disease readings from western regional hard red winter nursery grown on the L. B. Claridge farm, Kalispell, Montana in 1969.

CI or State No.	Variety	Stripe Rust		Dwarf Smut %
		Type ^{1/}	Prev. %	
UT 646001	Delmar/Columbia	3	2.0	1.0
MT 6319	Sel. Bulk	1	2.0	0.0
CI 8885	Cheyenne	2	5.0	4.0
WA 4836	Bezostaja 2/Sel. B			
CI 1442	Kharkof			
ID 0001	Atl 50 (Rio-Rex//2 Cnn)/4TK	1	1.0	1.0
CI 13426	Tendoy	0	1.0	4.0
ID 5001	(Rex-Rio x 6Cnn)XA.F.TK	0	0.0	1.0
MT 6531	Rego x Cnn 37-3-6	1	1.0	0.0
UT 522001	Utah 175A-53/Delmar	2	3.0	0.0
ID 5006	Nrn 10/Staring// 2 Cnn	0	1.0	5.0
ID 0007	Cheyenne/Utah 175A-53	1	1.3	.7
CI 13842	McCall	1	1.0	1.0
ID 0002	Orfed/WSC//Burt	1	4.0	.7
ID 0010	Cnn x Utah 175A-53	1	2.0	.1
CI 13846	Itana 65	0	1.0	.0
ID 0009	Cheyenne/Utah 175A-53	1	0.0	.0
CI 13844	Wanser	1	1.0	2.0
ID 0008	Cheyenne/Utah 175A-53	0	.3	.3
MT 6641	PI 178383x2Wmt, 16-1-8	0	0.0	.2
CI 10061	Rio	0	0.0	9.0
CI 13442	Delmar			
CI 13880	Crest	0	0.0	0.0
CI 12933	Itana	0	0.0	0.0

^{1/} Scale 0-4 stripe rust type.