

-9-

TITLE: Winter Wheat

PROJECT: Small Grains Investigations MS 756

YEAR: 1968

PERSONNEL: Leader: Vern R. Stewart
Cooperators: J. R. Welsh, Charles McQuire

LOCATION: Northwestern Montana Branch Station and several off station locations throughout 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:

Crest is 129% of Westmont over a four year period, Delmar does exceed Crest in yield for the same period.

PI 178383 + Westmont crosses provide a high degree of resistance to the dwarf smut.

Wa 4995 was the high yielding entry in the white wheat nursery.

In all locations summarized, Omar was high in yield of the white wheats and McCall the highest for hard red varieties.

FUTURE PLANS: Plans for 1968-69 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-4; 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-4. The off station nurseries were located in Ravalli, Missoula, Lake, Sanders and Mineral Counties. A nursery on the Lance Claridge farm northwest of Kalispell was grown to increase seed supply of breeding lines.

MATERIALS AND METHODS (con't):

Herbicide applications were made for weed control in the off station locations in early spring. Herbicide applications at Claridges and on the station were made in the fall. Where necessary follow-up applications were made in the spring to control any spring germinating weeds. The herbicide used for weed control was bromoxynil at a rate of 3/8 of a pound per acre. Plots were harvested with a power harvester.

RESULTS AND DISCUSSIONS:

Intrastate Nursery

Winter wheat was about average in yield in 1968 at the Northwestern Montana Branch Station. The highest yielding entry in the nursery was McCall at 79.0 bu/acre. Several varieties were found to be significantly lower in yield than Delmar the check variety. Dwarf Smut infection was not a factor in this nursery in 1968. Stripe rust readings were made and recorded. Lodging was severe in all varieties, which made harvest difficult. Test weights were above average. Table 1 shows tabulation of the data in this study.

In Table 2 is shown a summary of the data for 10 years at the Northwestern Montana Branch Station. Only two varieties in this years study have been grown in this study for 10 years. Over the 10 year period Cheyenne has out yielded the variety Westmont. This is due primarily to the dwarf bunt incidence that occurs in this region at times. Over a four year period Crest is 129% of Westmont. Over a four year period this variety has yielded 54.8 bu/acre as contrasted to Westmont with 42.5 bu/acre and Cheyenne 52.9 bu/acre. Delmar is the only variety that has a higher yield than Crest over a four year period.

Western Regional Hard Red Winter Wheat Nursery

Yield data was not significant in this nursery in 1968. Dwarf smut was light in this study. Some of the Westmont/PI 178383 back crosses show complete immunity to dwarf bunt. Crest has a 0 reading in 1968. Cheyenne a susceptible variety has a reading of .75%. Complete tabulation of these data are found in Table 3.

Test weights are excellent in this nursery.

Uniform White Wheat Nursery

High yields were obtained from the white wheat nursery grown on the station. Lodging resistance was very good in most of the white entries except Moro which tends to have weak straw. Golden and Karkoff in this study had high incidence of lodging. The high yielding entry was Wa 4995 with 98.83 bu/acre and was significantly higher in yield than Nugaines, the check. Test weights were below standard in many of the entries. (Table 4)

Table 1. Agronomic data from intrastate winter wheat nursery grown on the Northwestern Montana Branch Station in 1968. Field No. E-4. Experimental design - random block, 6 replications.

Seeding Date: September 19, 1967
Harvest Date: August 14, 1968
Size of Plot: 16 sq. ft.

Variety	Number	Yield bu/a	Heading Date	Plant Height	Test Wt lbs/bu	Stripe Rust		Lodging	
						Sever	Type	Prev	Sever
McCall	13842	76.79	6/18	47.67	62.1	12.00	6.84	65.00	5.84
Wanser	13844	76.49	6/17	50.00	62.0	6.17	5.84	65.00	4.34
Delmar ^{1/}	13442	67.91	6/20	49.00	61.0	3.84	6.34	70.00	6.00
Burt x 83 C63-11	6646	64.40	6/23	40.17	53.0	0.50	3.34	16.67	2.00
WMT/PI 178383 14-11-3	6729	59.95	6/17	49.34	61.5	0.67	2.34	67.50	6.84
Cheyenne	8885	57.19*	6/19	45.50	60.3	6.00	5.67	76.67	7.84
Winalta	13670	55.84*	6/17	47.50	61.0	6.84	5.84	70.84	6.34
WMT/PI 178383 8-10-6	6726	54.67*	6/14	42.34	58.5	0.84	2.34	80.00	8.84
WMT/PI 178383 12-6-3	6734	52.18*	6/18	44.00	61.8	1.67	3.67	85.00	8.34
WMT/PI 178383 8-8-1	6732	52.10*	6/16	44.50	61.8	2.17	3.67	76.67	7.84
Crest	13880	51.58*	6/14	41.67	59.8	1.84	4.50	85.00	8.50
PI 178383xWMT, 16-1-8	6641	48.75*	6/19	46.84	61.0	0.84	2.50	73.34	8.34
Westmont	12930	46.88*	6/14	46.67	61.9	48.34	8.17	75.84	8.67
Lancer	13547	44.01*	6/13	47.34	61.3	1.50	3.84	85.84	8.50
WMT/PI 178383 7-10-3	6721	41.90*	6/16	44.67	59.3	0.67	2.17	90.84	9.00
WMT-2 x 83 7-14-4	6634	36.08*	6/15	43.17	58.9	0.84	2.84	87.50	9.00

^{1/} Check variety

* Varieties yielding significantly less than the check (.05)

\bar{x} 55.4
S.E. \bar{x} 4.1
L.S.D..... 7.36
C.V.%..... 11.50

Analysis of Variance

Source	D.F.	M.S.	F.
Replications	5	39.5	.40
Varieties	15	801.2	8.02 *
Error	75	100.0	
Total	95		

Table 2. Summary of winter wheat data from the intrastate yield nurseries, 1959-1968, Northwestern Montana Branch Station

Variety	Number	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	Sta- tion West- yrs. mont	% West- mont	\bar{x}	2	3	4	10
															Yrs.	Yrs.	Yrs.	Yrs.
															Average bu/acre			
Cheyenne	8885	51.8	41.4	49.5	55.5	61.9	57.5	48.7	59.3	46.4	57.2	10	117	52.9	51.8	54.3	52.9	52.9
Westmont	12930	53.3	34.3	51.1	57.2	45.6	41.5	42.4	30.2	50.4	46.9	10	100	45.3	48.6	42.5	42.5	45.3
Delmar	13442				55.3	71.8	51.4	47.3	64.2	55.9	68.0	7	132	59.1	62.0	62.7	58.9	
Winalta	13670						54.4	31.4	67.4	44.9	55.8	5	120	50.8	50.4	56.0	49.9	
Burtx83 063-11	6646							50.1	81.8	58.4	64.4	4	150	63.7	61.4	68.2	63.7	
Crest	13880							40.8	73.4	53.5	51.5	4	129	54.8	52.5	59.5	54.8	
McCall	13842								56.4	51.9	76.8	3	145	61.7	64.4	61.7		
Lancer	13547								57.0	41.7	44.0	3	112	47.6	42.9	47.6		
Wanser	13844								73.9	51.7	76.5	3	159	67.4	64.1	67.4		
PI178383x2MTT																		
16-1-8	6641									54.8	48.8	2	107	51.8	51.8			
WMT-2x837-14-4	6634									45.8	36.1	2	84	40.5	40.5			
2MTT/PI178383																		
14-11-3	6729										60.0	1	128	60.0				
2MTT/PI178383																		
8-10-6	6726										54.7	1	117	54.7				
2MTT/PI178383																		
12-6-3	6734										52.2	1	111	52.2				
2MTT/PI178383																		
8-8-1	6732										52.1	1	111	52.1				
2MTT/PI178383																		
7-10-3	6721										41.9	1	89	41.9				

-14-