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 3. Agronomic data from the western regional hard red winter wheat nursery grown on the L. B. Claridge farm, Kalispell, Montana in 1968. Experimental design - random block, 4 replications.

Seeding Date: September 19, 1967
Harvest Date: August 9, 1968
Size of Plot: 16 sq. ft.

Variety	Number	Yield bu/a	Heading Date	Plant Height	Test Wt lbs/bu	Dwarf Smut
Delmar/Columbia	646001	51.44	6/17	38.50	62.5	1.00
Wanser	13844	50.94	6/17	37.50	61.6	8.75
WHT - 2 x 83 7-14-4	6634	50.64	6/16	34.75	61.6	0.50
CI 12932 x2 Burt, Sel. 1	4756	50.14	6/17	34.25	61.4	7.50
McCall	13842	49.77	6/18	34.50	62.0	15.00
ATL 50(R10-Rex2/2Cnn)/4TK	0001	49.02	6/17	34.75	61.6	0.50
Tendoy	13426	48.29	6/18	39.25	62.0	8.75
2 Wmt/PI 178383 8-8-1	6732	47.52	6/17	33.50	60.6	0.00
Columbia	12928	46.32	6/15	34.50	62.0	12.50
2 Wmt/PI 178383 14-11-3	6729	45.57	6/17	36.25	62.3	0.00
2 Wmt/PI 178383 12-6-3	6734	45.14	6/18	34.75	62.3	0.00
CI 12932 x 2 Burt Sel 17	4878	44.99	6/17	34.25	60.8	7.50
(Rex-Rio/2Cnn) 3Cnn	13867	44.61	6/14	38.00	61.4	1.25
2 Wmt/PI 178383 7-10-3	6721	44.44	6/16	34.00	60.7	0.25
PI 178383 x 2 Wmt, 16-1-8	6641	44.19	6/18	37.75	60.5	4.00
Bezosztaja 2/ Sel. B	4836	44.01	6/18	33.25	60.5	5.00
2 Wmt/PI 178383 8-10-6	6726	43.99	6/14	32.75	60.8	0.00
Crest	13880	43.81	6/14	31.75	60.8	0.00
Orfed/WSC 2/Burt	0002	43.44	6/17	34.75	61.5	6.25
(Rex-Rio x6 Cnn)xA.F. TK	5001	43.34	6/17	38.75	60.8	15.00
Cheyenne	8885	43.11	6/17	36.00	61.7	8.75
Cheyenne/Utah 175A-53	0008	42.39	6/17	38.00	61.5	2.25
Utah 175A-53/Delmar	522001	41.51	6/18	39.75	61.7	1.75
Cheyenne/Utah 175A-53	0009	41.16	6/17	35.25	60.9	8.00
Cheyenne/Utah 175A-53	0007	40.84	6/17	37.00	62.0	3.00
Itana	12933	40.16	6/17	37.50	61.6	4.00
NRN/10 Staring 2/2 Cnn	5006	37.26	6/18	26.00	60.5	8.75
Rio	10061	36.51	6/17	36.25	61.8	5.25
Itana 65	13846	36.39	6/18	35.50	61.4	8.75
Kharkof	1442	35.59	6/16	38.75	61.4	2.25
Delmar	13442	33.41	6/21	35.75	59.5	2.25

$\bar{x}$.....	43.9
S.E.$\bar{x}$.....	4.0
L.S.D.(.05)..	N.S.
C.V.%.....	9.07

Analysis of Variance

Source	D.F.	M.S.	F.
Replications	3	492.1	7.78
Varieties	30	89.6	1.42
Error	90	63.3	
Total	123		