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TITLE: Winter Wheat

PROJECT: Small Grains Investigations MS 756

YEAR: 1970

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. Crest was the leading hard red entry in yields.
2. Most lines with 35 or more inches of straw are too weak for effective production and harvest in this area.
3. The Burt x PI 178383 line continues to provide good resistance to dwarf smut and stripe rust.

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-2; 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-2. The off station nurseries were located in Ravalli, Missoula, Lake, Sanders and Mineral Counties.

Precipitation rates were recorded beginning April 17, until harvest. Small rain gauges were set up in locations adjacent or near the research plot. These were read by the farmer cooperator during the growing season. Gauges were located in Ravalli, Sanders, Lake and Mineral counties. There was not one set up in Missoula County because the plot was located in the vicinity of the airport.

Plots were harvested with a power harvester.

RESULTS AND DISCUSSIONS:Intrastate Hard Red Winter Wheat Nursery

ID 5006 was the highest yielding entry in this nursery, being significantly higher in yield than Crest which is used as a check. ID 5006 is quite susceptible to dwarf smut in another location. No smut readings were made in this nursery because of severe lodging throughout the study. ID 5006, WA 4836, Wanser and McCall displayed the most straw strength of the entries in the study. Table 1.

Table 2 is a ten year table of varieties grown in the above named nursery. Two long term checks have been left out for the past two years. Thus there is only Cheyenne left. McCall, Wanser and Crest are equal or better in yield than Cheyenne. However, McCall and Wanser are highly susceptible to dwarf smut. Crest is highly resistant to both dwarf smut and stripe rust.

Western Regional Hard Red Winter Nursery

Stands were fair in this nursery in spite of the late date of seeding (September 30). Only Delmar was found to be significantly less in stand than Cheyenne which is used as a standard.

Dwarf smut was found in all entries except the Burt x PI 178383 lines and ID 0027. A very light rate, .5% was found in Crest.

Yields were not significantly different in this study, however MT 6827 was the highest yielding entry. This line is somewhat late in maturity and could account for the lower test weight. See Table 3 for completed tabulation of data.

Uniform White Wheat Nursery

Yields in this nursery were about average. Luke was the highest yielding entry. Only a light rate of dwarf smut was noted. Paha (CI 14485) and Yamhill, new releases along with Luke, were quite high in dwarf smut. Nugaines and Paha were about equal in smut percentage.

Luke was significantly higher in yield than Nugaines as were OR 631305. Complete agronomic data are found in Table 4.

A summary of eight years yield data from this nursery is given in Table 6. Omar is used as the long term check. Based on six years data Moro is 110% of Omar at this location. Several of the newer entries are somewhat superior to Omar.

Missoula County

Yields were about average for this location, with a yield range of 36.8 bushels/acre down to 17.8 bushels/acre. Very dry conditions existed at seeding time and emergence was slow but uniform. Generally, the white wheat out yielded the hard red entries with Omar being the highest yielding entry. This yield was significantly higher than Crest, the check variety. Stands were low in the hard red entries which no doubt accounts for the yield reduction in this group.

Moro and Omar were highest in stand percentage. Table 7.

Table 3. Agronomic data from the western regional hard red winter wheat nursery grown on the Lance Claridge farm, Kalispell, Montana in 1970. Experimental design - random block, four replications.

Planting date: September 30, 1969 Harvest date: August 17, 1970 Size of plot: 16 sq. ft.

CI or State No.	Variety	Yield Bu/A	Test Wt Lbs/Bu.	Days Jan.1 to Heading	Plant Height	% Dwarf Smut	Lodging		% Stand
							% Prev.	Sev. 0-9	
MT 6827	Burt/PI 178383 14-1202	46.92	58.7	174	31.3	.0	0.0	.0	80.0
MT 6829	Burt/PI 178383 101-1200	41.41	59.3	173	30.3	.0	0.0	.0	80.0
MT 6826	Burt/PI 178383 4-1192	40.69	59.5	172	28.5	.0	0.0	.0	77.5
CI 1442	Kharkof	38.71	61.7	174	37.5	10.0	27.3	1.5	91.3
ID 0030	It*2/Ut*2//ID/B/3/13438	38.61	63.0	172	33.3	10.3	0.0	.0	86.3
UT 697010	It/Dm//Td/Ut 225-15-6	37.71	60.5	175	36.0	5.0	0.0	.0	93.8
CI 14580	Bridger	37.24	63.1	173	33.3	5.0	0.0	.0	91.3
ID 0007	Cheyenne/Utah 175A-53	37.04	62.5	175	33.5	11.5	0.0	.0	91.3
CI 10061	Rio	36.71	62.3	174	33.5	8.8	46.3	4.5	90.0
MT 6535	Rego/Cnn 39-7-4	36.51	60.4	173	34.8	6.5	0.0	.0	87.5
CI 13426	Tendoy	36.09	61.2	174	33.0	5.3	0.0	.0	90.0
CI 13842	McCall	35.99	61.0	174	30.5	16.8	0.0	.0	82.5
ID 0031	It*2/Ut*2//Id/B/3/13438	35.84	61.8	173	33.0	6.3	0.0	.0	85.0
MT 6641	Wmt*2/PI 178383	35.79	61.2	174	32.8	4.8	0.0	.0	87.5
MT 6828	Burt/PI 178383 13-1201	35.61	59.0	172	31.3	.3	0.0	.0	76.3
CI 8885	Cheyenne	35.59	61.5	173	32.0	8.8	0.0	.0	87.5
CI 13380	Crest	35.56	61.9	170	26.5	.5	27.5	2.5	80.0
CI 13846	Itana 65	35.21	61.5	173	32.3	20.0	0.0	.0	80.0
ID 0009	Cheyenne/Utah 175A-53	34.94	60.9	174	31.5	7.8	0.0	.0	83.8
CI 12933	Itana	34.86	61.7	174	33.5	13.8	0.0	.0	92.5
MT 691	Yogo/Rsc//Marmin/3/Td	34.46	61.0	174	33.5	.0	5.0	2.3	85.0
ID 0008	Cheyenne/Utah 175A-53	34.36	61.0	175	33.0	7.5	0.0	.0	83.8
ID 0010	Cnn/Utah 175A-53	34.06	62.4	173	32.0	6.5	0.0	.0	86.3
CI 13442	Delmar	34.04	61.6	175	35.3	4.0	0.0	.0	75.0
ID 0027	Wrr//Ka/PI 178383	32.74	62.3	172	30.5	.0	0.0	.0	77.5
CI 13844	Wanser	32.71	61.0	173	29.8	10.0	0.0	.0	76.3
ID 5006	Nrn10/Staring//2*Cnn	31.91	60.0	175	23.0	13.8	0.0	.0	82.5

\bar{x}	36.3	61.2	173.4	32.0	6.3	3.9	.4	84.4
F - value for variety comparison	1.58 NS	0.0	13.21**	12.55**	3.23**	3.0**	4.57**	1.86**
S.E. \bar{x}	2.43	0.0	.31	.82	3.02	6.45	.50	4.05
L.S.D. .05	6.85	0.0	.87	2.30	8.53	18.21	1.41	11.44
C. V. %	6.68	0.0	.18	2.55	44.66	164.4	125.18	4.80

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