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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 4

Agronomic data from the western regional white winter wheat nursery, grown at the Northwestern Montana Branch Station, Route 4, Kalispell in 1970. Field No. E-2 Experimental design - random block, four replications.

Planting date: September 29, 1969 Harvest date: August 11, 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 % Prev.	(0-9) Sev.
WA 5573	Luke	93.08*	60.4	169	35.5	1.3	24.8	2.3
OR 631305	Nord Desprez/2*Sel. 101	88.78*	58.8	163	33.0	1.3	49.5	.8
OR 63112	Nord Desprez/2*Sel. 101	87.33	58.7	165	31.8	3.0	0.0	.0
CI 14485	Suwon 92/4*Omar	87.00	58.2	167	35.0	6.3	0.0	.0
CI 14482	N10/B11//P14/3/14/53 101	81.98	60.5	164	33.3	7.8	0.0	.0
OR 6739	178383/2*Omar//13438	80.65	57.8	162	33.8	.3	0.0	.0
OR 611227	Yamhill	78.35	55.7	169	37.0	<u>11.3</u>	0.0	.0
CI 13968	Nugaines ^{1/}	77.58	61.5	165	31.5	6.3	0.0	.0
CI 12385	Brevor	75.83	59.9	167	40.5	6.3	52.0	2.8
CI 13740	Moro	75.37	56.4	167	43.0	.0	93.3	5.8
CI 13072	Omar	74.95	58.8	169	44.3	<u>11.3</u>	27.3	2.5
OR 6857	27-15//Rio/Rex/3/EG/4/MO	74.72	59.0	166	37.5	.0	2.5	.5
CI 11755	Elgin	74.12	58.1	169	42.8	<u>23.8</u>	24.8	2.0
CI 14483	Suwon 92/4*Burt	73.07	58.7	163	31.3	17.5	0.0	.0
CI 12696	Burt	71.60	58.0	163	41.8	6.5	12.5	2.0
CI 14484	14//53/Odin/3/CI 13431	71.30	60.2	168	31.3	12.5	0.0	.0
WA 5379	Omar Mutant 642084-808	68.62	58.3	169	32.0	1.5	0.0	.0
OR 6882	Oam/3/178383/2*Omar//101	67.35	59.4	169	45.5	.0	24.8	.5
WA 5572	Omar Mutant 642026-197	64.92 ^{2/}	59.6	167	40.3	5.0	74.3	2.5
CI 10063	Golden	64.17 ^{2/}	58.9	168	46.8	7.5	74.3	4.3
CI 5408	Triplet	63.57 ^{2/}	61.2	164	47.3	15.0	99.0	6.8
CI 1442	Kharkof	56.39 ^{2/}	59.7	165	50.0	<u>11.3</u>	74.3	6.3

* Varieties yielding significantly more than the check .05

^{1/} Check variety

^{2/} Varieties yielding significantly less than the check

\bar{x}	75.0	59.0	166	38.4	7.1	28.8	1.8
F - Value for variety comparison	5.14*	0.0	20.00**	85.15**	6.2**	5.38**	4.29*
SEX	4.01	0.0	.53	.65	2.56	14.79	1.06
L.S.D. .05	11.34	0.0	1.51	1.85	7.23	41.84	3.0
C.V.%	5.34	0.0	.32	1.70	36.23	51.41	60.31