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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 1. Agronomic data from the intrastate hard red winter wheat nursery grown at the Northwestern Montana Branch Station, Route 4, Kalispell in 1970. Field No. E-2 Experimental design - random block, six 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	Lodging	
						% Prev.	Sev. (0-9)
ID 5006	Mrn10/Staring//2*cnn	76.34 ² / ₁	60.0	166	32.0	0.0	.0
WA 4836	Bezosaasztaja 2 ¹ / ₁ BelB	74.27	61.6	162	38.1	0.0	.0
CI 13880	Crest ¹ / ₁	69.02	59.0	159	38.7	99.0	8.0
CI 13844	Wanser	65.52	58.6	161	42.8	82.5	1.7
CI 8885	Cheyenne	63.74	60.0	164	48.2	99.0	7.7
CI 13544	Sawmont	63.32	60.6	165	51.5	99.0	5.0
CI 13842	McCall	63.30	58.7	164	43.5	49.5	.7
MT 669	Rego x Cnn 39-10-10	62.49	59.5	164	52.2	99.0	6.8
MT 6611	Rego x Cnn 39-18-7	62.35	59.7	164	49.8	99.0	7.2
MT 668	Rego x Cnn 39-4-7	61.79*	59.8	163	48.3	99.0	7.0
CI 12923	Itana	61.10*	59.9	164	46.8	82.5	5.8
CI 13190	Warrior	60.79*	59.5	161	47.2	99.0	7.0
MT 6535	Rego/Cnn 39-7-4	59.02*	59.4	165	49.7	99.0	6.5
MT 692	MM/Yogo//Rsc/3/Td 123	58.79*	59.5	163	46.8	99.0	6.2
MT 6532	Rego x Cnn 37-12-4	58.74*	58.1	163	48.3	99.0	7.0
CI 13181	Rego	58.69*	58.0	164	49.8	93.5	7.3
MT 691	Yogo/Rsc//Marmin/3/Td	58.42*	57.1	179	48.0	99.0	7.5
CI 13547	Lancer	58.37*	60.4	159	44.5	99.0	5.3
MT 6616	Bel Bulk 6-142-6	58.30*	60.6	166	48.5	99.0	7.7
MT 6910	Wsc/Yogo//Rsc/3/Td 231	58.22*	59.7	163	47.8	99.0	4.0
MT 6531	Rego x Cnn 37-3-6	58.20*	58.6	163	49.2	99.0	7.0
MT 698	Wsc/Yogo//Rsc/3/Wrr 189	57.87*	59.4	162	46.5	93.5	6.2
CI 13670	Winalta	57.85*	61.0	163	46.7	99.0	5.8
CI 13526	Hume	57.52*	60.0	160	46.2	99.0	5.3
CI 14000	Winoka	57.15*	60.9	164	47.7	99.0	7.0
MT 693	Winalta 41	56.72*	61.1	163	46.5	99.0	7.3
MT 672	Sawmont - Lax	56.59*	60.8	165	49.0	99.0	6.7
CI 13999	Trapper	56.55*	59.6	162	46.5	99.0	7.5
MT 654	Sel Bulk 7-58	55.69*	60.0	164	48.7	99.0	7.2
CI 13872	Froid	55.53*	59.3	166	50.5	99.0	7.3

Table 1 (Con't)

CI or State No.	Variety	Yield Bu/A	Test Wt. Lbs/Bu.	Days Jan.1 to Heading	Plant Height	Lodging	
						% Prev.	Sev. (0-9)
CI 8033	Yogo	55.53*	59.6	166	50.2	99.0	7.2
MT 6615	Rego x Yto 457	55.38*	58.5	165	48.2	99.0	7.0
MT 671	Sawmont - Erect	55.18*	59.6	164	48.8	99.0	4.8
CI 13998	Trader	54.73*	59.0	162	46.2	99.0	6.3
MT 6610	Rego x Cnn 39-16-3	54.33*	59.5	165	52.3	99.0	7.0
CI 6938	Kharkof MC 22	53.25*	58.7	169	50.8	99.0	6.2
MT 694	Min/Yogo//Rsc/3/Yogo/Tk/O	52.32*	60.0	163	49.8	99.0	7.2
CI 6700	Karmont	50.30*	59.5	167	49.0	99.0	7.7

1/ Check variety

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

2/ Variety yielding significantly more than the check

\bar{x}	59.3	59.6	164	47.2	91.3	6.0
F - value for variety comparison	5.67*	0.0	1.44	21.43**	19.27**	13.80**
S.E. \bar{x}	2.24	0.0	2.73	.86	5.35	.56
L.S.D.	6.22	0.0	7.56	2.37	14.84	1.56
C.V. %	3.78	0.0	1.66	1.81	5.86	9.37

Table 2. Summary of selected winter wheat data from the intrastate yield nurseries grown at the Northwestern Montana Branch Station, Kalispell, Montana from 1961-1970.

Variety Number	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	Sta. Yrs.	% of Cheyenne	\bar{x}	2	3	4	10
														Yrs.	Yrs.	Yrs.	Yrs.
Cheyenne 8885	49.5	55.5	61.9	57.5	48.7	59.3	46.4	57.2	57.0	63.7	10	100	55.7	60.4	59.3	56.1	55.7
Rego 13181	46.7	60.6	60.2	49.9	42.5	62.4	43.6		51.3	58.7	9	95	52.7	55.0			
Winalta 13670				54.4	31.4	67.4	44.9	55.8	45.7	57.9	7	92	51.1	51.8	53.1	51.0	
Crest 13880					40.8	73.4	53.5	51.5	43.8	69.0	6	100	55.3	56.4	54.7	54.5	
McCall 13842						56.4	51.9	76.8	40.5	63.3	5	102	57.8	51.9	60.2	58.1	
Lancer 13547						57.0	41.7	44.0	38.3	58.7	5	84	47.9	48.5	47.0	45.7	
Wanser 13844						73.9	51.7	76.5	56.0	65.5	5	114	64.7	60.8	66.0	62.4	
Itana 12933	48.0	50.3	54.5	46.8	38.3	58.2				61.1	7	90	51.0				
Warrior 13190				45.8	37.1	59.5	43.5			60.8	5	90	49.3				
Karmont 6700	44.4	50.4								50.3	3	86	48.3				

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