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- TITLE: Winter Wheat
- PROJECT: Small Grains Investigations MS 756
- YEAR: 1971
- PERSONNEL: Leader - Vern R. Stewart  
Cooperator - G. A. Taylor
- LOCATION: Northwestern Agricultural Research Center 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 cooperate in 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. Semi-dwarf lines used provide good straw strength, but are not satisfactory for dwarf smut resistance.
  2. Lines with PI 178383 parentage provide good dwarf smut resistance.
  3. Cheyenne or Cheyenne types are best suited for Ravalli County wheat growing area.
- FUTURE PLANS: Plans for 1971-72 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 Agricultural Research Center in Field E-3; 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 Agricultural Research Center in Field E-3. The off station nurseries were planted in Ravalli, Missoula, Lake, Sanders and Mineral Counties.

Plots were harvested with a power harvester.

RESULTS AND DISCUSSIONS:Intrastate Hard Red Winter Wheat Nursery

Four semi-dwarf lines were significantly higher in yield than Crest the check variety, and had exceedingly good straw strength. In all four varieties there was a high incidence of dwarf smut. Table 1. The mean of the nursery 52.3 bu/a is about average for the area in which it was grown. Lodging was very severe throughout the nursery except for the semi-dwarf lines already discussed.

In this area only short strawed or very strong strawed varieties should be considered for future testing.

Nine varieties are included in the ten year summary as seen in Table 2. Cheyenne is used as the long term check and is the only variety grown for the last consecutive ten years. Wanser, McCall and Crest are the only varieties that are equal to or exceed Cheyenne in yield. Only Crest is resistant to the prevalent race of dwarf smut.

Western Regional Hard Red Winter Nursery

The C.V. is rather high in this nursery because of unevenness in stands in replication number three. The dwarf smut level was not high, but of a high enough level to secure good differential reading. McCall and Wanser, both high yielding varieties, are very susceptible to dwarf smut. A trace amount of dwarf smut was noted in the variety Crest this season.

There were no yields significantly higher than Crest (the check) in this nursery, however twelve entries were found to be significantly lower. The mean of 36.6 bu/a is about average for this area of the valley.

Uniform White Wheat Nursery

Dwarf smut levels in this nursery were sufficient to make good differential reading between entries. Those lines with P.I. 178383 in their parentage had a high level of resistance. Luke and Nugaines were about equal in yield. Straw strength in Luke is some less than Nugaines. There were no other entries in the nursery that would be of potential value in this area, because of their susceptibility to dwarf smut. Luke is about four days later in heading than Nugaines and two to three inches taller. See Table 4 for complete details.

Seven varieties have been tested for nine years in this nursery (Table 5). Some of these will be dropped in the 1972 growing season as long time checks. Based on two years data at this location plus additional data from Washington and Oregon, Luke is to be added to the recommended list for 1972. A seed increase is being grown this season.

Off Station Nurseries

These nurseries were composed of 16 entries.

A severe infestation of blue mustard in the nursery located on the Jack Marrian farm in Sanders County, made harvest impossible and the nursery was abandoned. Very poor wheat stands in Mineral County was the reason for dropping this nursery. This study was located on the Elmer Hankenson farm near Tarkio, Montana.

Table 3. Agronomic data from the Western Regional Hard Red Winter Wheat Nursery grown on the Lance Claridge farm, Kalispell, Montana in 1971. Experimental design - random block, four replications.

Planting date: September 18, 1970  
Harvest date: August 18, 1971  
Size of plot: 16 sq. ft.

C. I. or State No.	Variety	Yield Bu/A	Test Weight Lbs/Bu	Head <sup>1/</sup> ing Date	Plant Height	Dwarf Smut %	Stripe Rust Sev. %	Rust Type 0-9
	13842 McCall	48.89	62.5	171a	38.5	13.8a	.0	.0
MT	6826 Burt/PI 178383 4-1192	47.89	59.5	167a	37.8	.0	.0	.0
	13844 Wanser	46.77	61.5	168a	39.8	13.8a	.0	.0
	13880 Crest <sup>2/</sup>	46.47	61.5	165	36.8	.3	.0	.0
MT	6929 NB176/Y18181//YTO1171-3	43.16	60.0	169a	39.3	.0	.0	.0
ID	0039 II-60-157/Wanser//IT	42.41	61.0	165	35.0	11.5a	.0	.0
	13426 Tendoy	41.99	62.0	170a	43.3a	6.3	.0	.0
UT	755079 DM/178383//Columbia	39.74	61.5	171a	44.3a	.0	.0	.0
ID	0037 IT//KO/PI178383	39.54	62.0	169a	43.8a	1.5	.0	.0
MT	691 Yogo/RSC//Marmin/3/TD	39.04	59.5	170a	45.3a	5.0	.0	.0
	1442 Kharkof	38.14	61.5	171a	47.8a	9.0	.3	.8
MT	6827 Burt/PI 178383 14-1202	37.81	58.5	169a	35.5	.0	.0	.0
ID	5010 178383/Cnn//3*Tendoy	37.71	61.0	170a	41.5a	1.5	.0	.0
MT	6828 Burt/PI 178383 13-1201	37.49	60.0	168a	37.8	.3	.0	.0
ID	0031 IT*2/UT*2//ID/B/3/13438	37.21	62.5	167a	43.0a	4.0	.0	.0
ID	0030 It*2/UT*2//ID/B/3/13438	36.06	62.5	168a	43.8a	1.5	.3	.5
ID	0027 WRR//KO/PI 178383	35.99	62.0	165	39.8	.0	.0	.0
	8885 Cheyenne	34.29	61.5	170a	39.8	4.0	.0	.0
ID	0038 Cnn*2/PI 178383	34.01	60.0	172a	42.3a	.0	.0	.0
ID	5011 178383/Cnn//3*Tendoy	33.49*	59.0	175a	45.0a	2.5	.0	.0
	13846 Itana 65	32.79*	61.0	171a	40.3	5.3	.0	.0
	14580 Bridger	32.04*	63.0	169a	41.0	.0	.3	1.3
WA	5835 Bez-1//Bnk1205/CI 13438	31.66*	60.5	173a	31.0	7.5a	.0	.0
	10061 Rio	31.61*	62.0	171a	40.8	5.3	.0	.0
WA	5836 Bez-1//CI 13438/Burt	31.31*	61.0	168a	26.0a	7.5a	.0	.0
	12933 Itana	30.76*	61.0	171a	40.8	12.5a	1.3	2.3
ID	5012 Sonora 37/Cln//2*Tendoy	30.51*	60.0	168a	30.5a	.5	.0	.0
MT	6535 Rego/Cnn 39-7-4	30.36*	60.5	171a	44.8a	8.8a	.0	.0
ID	0010 Cnn/Utah 175A-53	30.36*	61.5	170a	39.0	1.0	.3	1.8
UT	697010 IT/DM//TD/UT 225-15-6	27.26*	60.0	172a	43.0a	10.0	.0	.0
UT	755029 DM/178383//Columbia	26.53*	62.0	168a	36.0	.0	.5	2.5

<sup>1/</sup> January 1 to heading

<sup>2/</sup> Check variety

\* Varieties yielding significantly lower in yield than the check (.05)

a Values significantly different from the check

$\bar{x}$	36.6	59.2	169.3	39.8	4.3	.1	.3
F-value for variety comparison	1.74*	0.0	11.01*	8.21*	3.44*	1.0	1.1
S.E. $\bar{x}$	4.57	0.0	.70	1.65	2.47	.25	.65
L.S.D. (.05)	12.82	0.0	1.97	4.64	6.95	N.S.	N.S.
C.V. %	12.49	0.0	.41	4.15	57.65	277.54	225.50