

TITLE: Spring Wheat
PROJECT: Small Grains Investigations 756
YEAR: 1973
PERSONNEL: Vern R. Stewart
Cooperators - F. H. McNeal and M. A. Berg

COOPERATING AGENCIES:

Montana Agricultural Experiment Station
Field Crops Branch, ARS, USDA
Montana Wheat Research and Marketing Committee

OBJECTIVES:

1. To determine the adaptability of new introduced spring wheat varieties and selections by comparisons with recommended varieties.
2. Study the semi-dwarf strains of spring wheat for use under irrigated conditions.
3. To aid in basic genetic research in spring wheat and the overall breeding program.

1973 EXPERIMENTS:

1. Advanced Yield Nursery (dryland)
2. Western Regional Spring Wheat Nursery (dryland)
3. Private Variety Nursery (dryland)

SUMMARY OF 1973 RESULTS:

Spring Wheat (1) The hard red semi-dwarf out yielded the taller standard wheats. Norana, a semi-dwarf type, is a new release for western Montana. Era is the highest yielding semi-dwarf type over a five year period in western Montana, but is somewhat weak in baking quality. ID 43 needs further evaluation, because of its high yield and earliness. (2) The soft white wheats were 2 to 3 bushels higher in yield on the average than the hard red types. ID 46 was the highest yielding variety in 1973, but not significantly higher than Twin, a recommended variety for western Montana. ID 46 is 4 days earlier in heading which could be a valuable asset in western Montana. (3) There were no real significant differences found between commercial varieties tested and Norana (HR) which was used as the check variety. Twin (SW) was superior in yield to all private lines tested.

1973 RESULTS BY NURSERY:

Advance Yield Nursery - The mean for this nursery was 62.0 bu/a down 12.8 bu/a from the 1972 nursery. This is due to lower rain fall during the 1973 crop year. Norana, a new release, is used as the check variety. Era is equal to Norana, MT 738 is the highest yielding entry, however no entry was significantly higher in yield than the check.

The semi-dwarf lines out yielded and are superior agronomically to the tall standard varieties.

ID 43 is the earliest heading entry in the nursery, 4 days ahead of Norana. Its earliness could be a real asset for spring wheat production in western Montana. Table 1.

Table 2 gives a summary of yield data of spring wheat varieties grown from 1964-1973. Thatcher is used as a base of 100%. Era and Norana out yield Thatcher by 36% and 26% respectively. There are other entries that exceed these percentages but are for a very short term. Comparing the yield of Norana and Era 1971-73, they yield 82.7 bu/a and 85.2 bu/a respectively. Era, a semi-dwarf, continues to out preform all other semi-dwarf types agronomically.

Results (con't)

Western Regional Spring Wheat - Thirty-two entries are included in the nursery. There are 17 soft whites, 2 hard whites and 13 reds. Twin, a soft white variety, which is currently recommended for western Montana averaged 95.5 bu/a and no other entry was found to be significantly higher in yield. Anza, a hard red entry was the highest yielding entry at 98.7 bu/a.

The hard red varieties yielded 81.3 bu/a and the soft white varieties 83.6 bu/a.

Lodging data was obtained, but is not made a part of this record because the differences were not found to be statistically significant. Table 3.

Private Variety Nursery - This nursery contains lines and varieties developed by commercial companies and public varieties for comparison. Twin is the highest yielding entry at 94.41 bu/a followed by Era at 90.68 bu/a. Norana is used as a check for comparison. Twin was found to be significantly higher in yield statistically than Norana. None of the commercial lines were significantly lower in yield than Norana. Triticales varieties in this test were quite low in yield and very late in maturity.

Table 1. Agronomic data from the western regional hard red winter wheat nursery grown at the Northwestern Agricultural Research Center, Kalispell, Montana, 1973 in Field R-8a.

Date Seeded: September 20, 1972 Date Harvested: August 10, 1973 Size of Plot: 16 sq. ft.

C.I. or State No.	Variety	Yield Bu/A	Test Wt. Lbs/Bu.	Heading Date	Plant Height	Lodging		% Stand	Smut at Stillwater
						% Prev	Sev.		
ID 71040	Moscow 71040	53.87a	57.80	168.25a	32.00	.00b	.00b	97.50	
ID 725055	ID 5011/ID 5006	53.17a	61.20	167.50a	32.50	.00b	.00b	100.00a	
UT 819116	DM/CLM//Burt/PI 178383	52.92a	61.40	163.75	40.25a	.00b	.00b	91.25	
WA 5835	Bez-1//Bnk1205/CI13438	52.84a	60.60	169.00a	32.25	.00b	.00b	97.50	
ID 725058	ID 5011/WA 4765, Sel. 3	51.94a	60.60	171.00a	40.25a	.00b	.00b	97.50	x
UT 755090	DM/178383/CLM	51.02a	61.40	165.00a	37.00a	24.75b	.25b	93.75	
ID 725056	ID 5011/WA 4765, Sel, 1	50.97a	58.50	171.25a	31.75	.00b	.00b	100.00a	
CI 13844	Wanser	50.47a	62.50	163.50	36.25a	.00b	.00b	97.50	x
UT 755204	DM/178383/Clm	49.89a	62.90	164.75a	40.25a	99.00	1.00	96.25	x
ID 37	IT//KO/PI 178383	49.54a	63.40	164.75a	38.75a	99.00	2.50	96.25	
CI 15317	Franklin	48.97a	60.80	167.50a	40.50a	49.50b	.50b	96.25	x
UT 84557	DM/173438//CLM/3/DM/4/CO	48.52a	60.80	166.00a	40.25a	99.00	2.50	96.25	
MT 6829	Burt/PI 178383 101-1200	47.09	60.40	163.75	34.75a	24.75b	.25b	97.50	
UT 821252	Warrior//Burt/PI 178383	47.02	59.10	166.50a	37.00a	24.75b	.25b	97.50	
WA 5836	Bez-1//CI 13438/Burt	46.92	61.40	163.50	25.25b	.00b	.00b	100.00a	
ID 72	Cnn*2/PI 187383	46.52	61.20	166.00a	40.50a	74.25	1.00	100.00a	x
WA 5984	BNK 1205/Burt//14/53-1	46.42	59.00	164.25a	31.50	24.75b	.25b	86.25	
CI 15286	Ark	45.54	62.60	164.50a	38.25a	49.50b	.50b	98.75a	
CI 15316	Ranger	44.94	62.50	160.75	36.00a	99.00	1.00	97.50	x
CI 1442	Kharkof	42.94	59.50	168.75a	42.25a	99.00	1.50	100.00a	
ID 75	CI 14106/CLM//McCall	40.86	61.90	166.75a	35.75a	74.25b	2.25	92.50	x
MT 6827	Burt/PI 178383 14-1202	40.76	58.70	168.50a	33.75a	.00b	.00b	91.25	
MT 6828	Burt/PI 178383 13-1201	39.74	59.10	166.00a	34.00a	.00b	.00b	90.00	
CI 12933	Itana ^{1/}	37.29	60.90	162.25	31.50	99.00	1.75	82.50	
WA 5985	BNK 1205/Burt//14/53-1	36.76	58.50	166.50a	31.00	.00b	.00b	66.25b	
UT 80702	DM/173438//CLM/3/DM	32.74	62.60	165.00a	38.00a	24.75b	1.00	65.00b	x
ID 33	MN60157/McCall//Moran	22.21b	58.40	166.75a	35.75a	24.75b	.50b	28.75b	

\bar{x}	45.6	60.7	166.0	35.8	36.7	.6	90.9
$F^2/$	3.90**	.0	8.44**	26.75**	6.50**	4.35**	7.72**
S.E. \bar{x}	3.67	.0	.86	.78	15.78	.39	5.53
L.S.D.(.05)	10.31	.0	2.41	2.19	44.38	1.10	15.56
C.V.%	8.04	.0	.52	2.17	43.03	61.85	6.09

1/ Check variety

2/ Value for variety comparison

a/ Values significantly greater than the check .05 level
 b/ Values significantly less than the check .05 level

** Indicates statistical significance at .01 level

SPRING WHEAT VARIETIES

SPRING WHEAT VARIETIES RECOMMENDED FOR WESTERN MONTANAHard Red Varieties

1. Norana - non irrigated and irrigated
2. Shortana - non irrigated and irrigated
3. Thatcher - dryland
4. Fortuna - dryland

Soft White Variety

1. Twin - non irrigated and irrigated

CHARACTERISTICS OF RECOMMENDED VARIETIES

1. Norana
 - a. Bearded variety, developed in Montana
 - b. Very high yielding ability
 - c. Semi dwarf type
 - d. Maturity - mid season to late
 - e. Good test weight
 - f. Excellent straw strength
 - g. Good shattering resistance
 - h. Resistant to stem rust
 - i. Resistant to loose smut
 - j. Resistant to moderately resistant to stripe rust
 - k. Good milling and baking quality
2. Shortana
 - a. Bearded variety developed in Montana
 - b. High yielding variety
 - c. Semi dwarf type
 - d. Maturity - mid season to late
 - e. Low test weight
 - f. Excellent straw strength
 - g. Good shattering resistance
 - h. Moderately resistant to stem rust
 - i. Susceptible to leaf rust
 - j. Resistant to stem rust
 - k. Moderately resistant to stripe rust
 - l. Acceptable milling and baking quality
3. Thatcher
 - a. Beardless variety developed in U.S.A.
 - b. Fair yielding ability
 - c. Medium height
 - d. Early maturity
 - e. Good test weight
 - f. Fair to good lodging resistance
 - g. Good shattering resistance
 - h. Susceptible to leaf rust
 - i. Resistant to stripe rust
 - j. Good milling and baking quality

4. Fortuna
 - a. Beardless variety developed in North Dakota
 - b. Good yielding ability
 - c. Medium to tall height
 - d. Medium maturity
 - e. High test weight
 - f. Poor to fair lodging resistance
 - g. Somewhat susceptible to shattering
 - h. Resistant to most common races of stem rust
 - i. Resistant to most common races of leaf rust
 - j. Fair to good milling and baking quality

Soft White Variety

1. Twin
 - a. Beardless variety developed in Idaho
 - b. Very high yielding ability
 - c. Semi dwarf type
 - d. Medium to late maturity
 - e. Low test weight
 - f. Excellent straw strength
 - g. Good shattering resistance
 - h. Resistant to stripe rust
 - i. Resistant to stem rust
 - j. Susceptible to leaf rust
 - k. Susceptible to powdery mildew
 - l. Pastry quality is satisfactory