

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.

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

Table 1. Agronomic data from the advanced yield springwheat nursery grown at the Northwestern Agricultural Research Center, Kalispell, Montana in 1973. Field No. Y-2

Planting Date: April 24, 1973 Harvest Date: August 30, 1973
Size of Plot: 16 sq. ft.

C.I. or State No.	Variety	Yield Bu/A	Test Wt. Lbs/Bu.	Heading Date	Plant Height
MT 738	Nrn10/Bvr14//6*Cnt/3/SI	75.05	60.20	180.50	34.75a
MT 7156	SI/3/Nrn10/Bvr14//5*Cnt	72.72	60.70	181.00	31.50
CI 15927	Norana (MT 7042) ^{1/}	69.67	59.40	180.50	32.25
CI 13986	Era	69.57	61.00	181.00	32.00
ID 43	58/TC//TC/KF/3/Ftn/3*TC	69.50	59.30	176.00b	31.00
MT 7150	JT/3/Nrn10/Bvr14//4*Cnt	68.85	59.10	179.25b	36.00a
CI 14588	Twin - ID0015	68.60	56.00	182.50a	34.00
MT 711	Fortuna/62-85	67.25	61.50	180.75	41.00a
S 6914	S6579/S659	66.35	60.50	177.50b	41.50a
MT 7028	SK/3/Nrn10/Bvr14//Cnt	63.35	58.40	180.00	34.75a
MT 7145	Weibulls 7327/Cnt	63.15	61.00	181.00	41.75a
MT 7031	JT/3/Nrn10/Bvr14//4*Cnt	62.75	58.60	178.50b	34.50a
S 6921	34-359/61-107	62.50	62.00	176.75b	41.00a
ND 683	Fortuna*2/57-134	62.27	60.60	178.50b	38.75a
MN 6433	II-55-14/II-60-105	61.47	58.50	180.25	32.25
CI 13596	Fortuna	60.52	61.10	178.50b	42.00a
MT 722	64-129/Fta	60.47	60.00	178.75b	42.25a
ND 491	ND140/ND363	59.64	58.00	175.75b	40.50a
CI 15233	Shortana	59.34	58.50	181.00	33.50
RL 4238	Manitou*2/RL4124*1	58.67b	59.10	178.75b	42.50a
MT 7318	Nrn10/Bvr14//6*Cnt/3/SI	58.64b	59.20	182.50a	31.75
ND 6662	Fta/62-85, S6662	58.57b	60.50	180.25	41.25a
ND 497	North Dakota 497	58.02b	58.50	177.00b	34.00
MT 7111	Fta/Tzpp//Son 64A	57.87b	59.50	178.75b	40.50a
MT 727	61-107//Tzpp/Son64A	57.04b	60.90	176.75b	38.50a
CI 12974	Centana	55.57b	60.60	182.00a	47.25a
CI 10003	Thatcher	55.02b	59.70	178.50b	41.25a
MT 7152	SI/3/Nrn10/Bvr14//4*Cnt	54.12b	57.00	180.50	33.75
CI 13775	Manitou, R.L. 4159	53.82b	58.90	179.00b	43.00a
CI 13333	Wells	49.94b	61.00	180.50	44.75a
	\bar{x}	62.0	59.6	179.4	37.8
	$F_{2/}$	2.78	.00	21.92	44.16
	S.E. \bar{x}	3.64	.00	.39	.70
	L.D.S. (.05)	10.24	.00	1.10	1.97
	C.V.%	5.88	.00	.22	1.85

1/ Check variety

2/ Value for variety comparison

a Values significantly greater than the check .05

b Values significantly less than the check .05

Table 2. Summary of dryland, hard red spring wheat yields for the advanced yield nursery grown at the Northwestern Agricultural Research Center, Route 4, Kalispell, Montana, 1964 thru 1973.

C.I. or State #	Variety	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	Ave.	Sta. Yrs.	% of Thatcher
CI10003	Thatcher	46.7	65.4	62.2	60.6	63.4	69.5	55.5	72.5	64.7	55.0	61.6	10	100
CI13333	Wells	57.1	58.4	67.9	62.8	63.1	64.8	53.7	66.8	54.1	49.9	59.9	10	97
CI12974	Centana	47.8	61.1	50.4	54.5	66.1	61.9	52.8	71.1	57.0	55.6	57.8	10	94
CI13775	Manitou	50.8	62.2	67.5	57.5	57.6	70.7	66.9	67.1	61.5	53.8	61.4	10	100
CI13596	Fortuna	62.9		66.2	56.4	74.7	88.9	41.9	76.8	56.2	60.5	64.9	8	106
CI15233	Shortana					71.8	71.9	80.2	70.6	87.4	59.3	73.5	6	116
CI13986	Era						93.1	82.2	90.0	96.1	69.6	86.2	5	136
CI15927	Norana (MT 7042)								90.8	87.6	69.7	82.7	3	126
CI14588	Twin - ID0015									93.4	68.6	81.0	2	135
MT 7150	UT/3/Nrn10/Bvr14//4*Cnt									86.7	68.9	77.8	2	130
MT 7156	SI/3/Nrn10/Bvr14//5*Cnt									83.9	72.7	78.3	2	131
MT 7031	UT/3/Nrn10/Bvr14//4*Cnt									80.1	62.8	71.5	2	119
MT 711	Fortuna/62-85									71.9	67.3	69.6	2	116
ND 6662	Fta/62-85, S6662									62.7	58.6	60.7	2	101
MT 738	Nrn10/Bvr14//6*Cnt/3/SI										75.1	75.1	1	137
ID 43	58/TC//TC/KF/3/Ftn/3*TC										69.5	69.5	1	126
S 6914	S6579/S659										66.4	66.4	1	121
MT 7028	Sk/3/Nrn10/Bvr14//Cnt										63.4	63.4	1	115
MT 7145	Weibulls 7327/Cnt										63.2	63.2	1	115
S 6921	34-359/61-107										62.5	62.5	1	114
ND 683	Fortuna *2/57-134										62.3	62.3	1	113
MN 6433	II-55-14/II-60-105										61.5	61.5	1	112
MT 722	64-129/Fta										60.5	60.5	1	110
ND 491	Nd140/ND363										59.6	59.6	1	108
RL 4238	Manitou*2/RL4124.1										58.7	58.7	1	107
MT 7138	Nrn10/Bvr14//6*Cnt/3/SI										58.6	58.6	1	107
ND 497	North Dakota 497										58.0	58.0	1	105
MT 7111	Fta/Tzpp//Son64A										57.9	57.9	1	105
MT 727	61-107//Tzpp/Son64A										57.0	57.0	1	104
MT 7152	SI/3/Nrn10/Bvr14//4*Cnt										54.1	54.1	1	98