

TITLE: Spring Wheat
PROJECT: Small Grains Investigations 756
YEAR: 1974
PERSONNEL: Leader - 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 & 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.

1974 EXPERIMENTS:

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

1974 RESULTS BY NURSERY:

Advanced Yield - The mean for this nursery was 89.44 bu/acre, which is 25.44 bu/acre more than in 1973. This is due in part to the early seeding and favorable moisture early in the growing season. Using Norana as a check, Cajeme 71 was found to be significantly higher in yield. Era and Borah were about 4 bu/acre more in yield than Norana. Era had the highest test weight of all entries, however the mean for the nursery was quite high with 60.83 lbs/bu. The semi-dwarf lines out-yielded all of the tall type varieties and lines in the test. Borah was the earliest heading variety in the test. Table 1.

Table 2 is a 10 year summary of varieties grown at the Northwestern Agricultural Research Center. Thatcher is used as the check for this summary. Only two varieties yield less than Thatcher. All other varieties exceed the variety Thatcher. Other comparisons can be made from this table.

Western Regional Spring Wheat - Twenty-seven entries were grown in this nursery. There were 12 soft white, 2 hard white, 10 hard red and 3 which were unclassified. Twin, the variety recommended for Montana, was very severely damaged by a high level of leaf rust which resulted in a severe reduction in yield and test weight. Using Twin as a check we see many lines and varieties that are far superior in yield. The highest yielding hard red variety is ID 47, the highest yielding white variety is ID 94. Comparing the white and red types we find for the first year the mean for the hard red is higher than the white types - 97.34 bu/acre and 85.70 bu/acre respectively. Table 3.

Table 4 gives a summary of varieties grown in the Western Regional Nursery. All varieties are compared to Twin in this summary. Based on four years data Fielder is 17% higher in yield than Twin.

Private Varieties - This nursery contains lines and varieties developed by commercial companies which are compared to several varieties used as checks. Norana is used as a check for statistical purposes. The low C.V. would indicate that this is a good test. Fielder, a white variety, was significantly higher in yield than Norana. None of the private varieties were found to be significantly higher or lower in yield than Norana. Table 5.

SPRING WHEAT VARIETIES

SPRING WHEAT VARIETIES RECOMMENDED FOR WESTERN MONTANA

Hard 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 Variety1. 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

VARIETIES NEEDING ADDITIONAL EVALUATIONSoft White Variety1. Fielder

- a. Bearded variety developed in Idaho
- b. Very high yielding ability
- c. Semi-dwarf type
- d. Medium to late maturity
- e. Fair test weight
- f. Good straw strength
- g. Good shattering resistance
- h. Moderately resistant to stripe rust
- i. Slight resistance to leaf rust

Hard Red Spring1. Borah

- a. Bearded
- b. Very high yielding ability
- c. Semi-dwarf type
- d. Medium maturity
- e. Low to fair test weight
- f. Resistant to shattering
- g. Resistant to stripe rust
- h. Susceptible to leaf rust
- i. Stem rust resistant

Table 1. Agronomic data from the advanced yield spring wheat nursery grown at the Northwestern Agricultural Research Center, Kalispell, Montana 1974. Field Y-4. Random block design, 4 replications.

Date seeded: April 23, 1974 Date harvested: September 5, 1974 Size of plot: 16 sq. ft.

C.I. or State No.	Variety	Yield Bu/A	Test Wt. Lbs/Bu.	Heading Date	Plant Height	Lodging		Leaf Rust		Stripe Rust	
						% Prev	Sev.	% Prev	Sev.	% Prev	Sev.
MT 7350	Cajeme 71(BB No 4)	109.49a	61.70	180.25b	29.75b	.00	.00b	.00	.00b	3.25	3.00
CI 13986	Era	102.93	62.10	182.75	35.75	78.50a	7.00a	.00	.00b	2.00	2.75
CI 17267	Borah	102.86	60.40	177.50b	31.75b	20.00	1.75	20.25	3.00b	2.50	1.00b
MT 738	Nrn10/Bvr14//6*Cnt/3/SI	101.53	60.20	182.00	36.75	49.75	4.25	21.50	6.75	7.75	4.75
MT 7156	SI/3/Nrn10/Bvr14//5*Cnt	99.11	59.70	182.00	34.25b	15.00	3.25	13.25	4.75	2.25	4.00
CI 15927	Norana (MT 7042) ^{1/}	98.36	60.10	182.25	36.50	32.25	3.00	5.50	5.75	5.25	3.50
MT 735	Nrn10/Bvr14//6*Cnt/3/SI	98.18	61.60	182.50	37.25	77.00a	3.50	76.00a	8.25a	.25	1.25b
CI 15926	Wared	98.01	60.30	182.50	35.75	43.50	3.00	.00	.00b	6.25	4.00
CI 15233	Shortana	97.76	60.40	182.50	36.50	24.75	.25b	33.75a	7.50	4.25	3.25
MT 7312	Nrn10/Bvr14//6*Cnt/3/SI	96.23	60.50	181.00b	36.50	42.25	.75	8.75	6.00	11.25	4.50
MT 7310	Nrn10/Bvr14//6*Cnt/3/SI	93.81	61.00	181.25b	36.00	67.50	6.00a	.50	1.25b	2.00	3.25
CI 15892	Ward (Durum)	93.38	61.40	180.25b	44.25a	84.25a	2.00	12.50	2.25b	5.25	4.75
MT 739	Nrn10/Bvr14//6*Cnt/3/SI	92.93	60.50	181.75	34.75	86.75a	2.00	8.75	5.00	7.00	3.25
MT 7031	Jt/3/Nrn10/Bvr14//4*Cnt	91.23	60.30	179.00b	36.50	.00	.00b	38.75a	7.50a	.25	.75b
MT 737	Nrn10/Bvr14//6*Cnt/3/SI	90.28	61.00	181.00b	37.75	99.00a	1.50	.00	.00b	3.25	3.25
MT 734	Nrn10/Bvr14//6*Cnt/3/SI	90.18	61.50	181.25b	37.25	70.00	5.50a	.00	.00b	5.50	3.25
MT 7313	Nrn10/Bvr14//6*Cnt/3/SI	89.55	61.80	181.50	38.75a	71.00	4.00	.00	.00b	4.00	3.00
MN 6433	II-55-14/II-60-105	88.73	60.20	181.25b	35.00	76.00a	4.75	.00	.00b	6.50	3.75
MT 711	Fortuna/62-85	88.60	61.80	182.75	44.00a	91.75a	6.50a	.00	.00b	2.00	3.25
MT 7145	Weibulls 7327/Cnt	85.18b	62.10	182.00	45.25a	99.00a	1.00	92.25a	9.00a	.50	2.50
CI 15930	Olaf	84.83b	61.40	179.75b	36.00	24.75	.25b	.00	.00b	.00	.00
CI 13333	Wells	83.78b	58.60	181.75	46.25a	86.75a	4.75	26.25a	5.00	11.50	4.00
CI 13596	Fortuna	81.85b	62.00	180.25b	45.00a	89.25a	5.25	.00	.00b	4.00	3.75
CI 17286	Tioga	80.95b	61.00	181.50	44.75a	57.50	6.50a	.00	.00b	43.75a	7.00
CI 13775	Manitou, R.L. 4159	77.48b	60.00	179.00b	44.25a	74.50	2.75	12.50	1.50b	.00	.00b
S 6914	S6579/S659	76.08b	60.10	177.00b	43.00a	89.25a	1.75	.00	.00b	6.50	4.75
CI 17289	Ellar	75.70b	61.20	178.00b	42.50a	24.75	.25b	28.75a	4.25	2.50	1.50b
CI 12974	Centana	73.97b	61.80	182.25	47.25a	49.75	4.25	13.75	9.00a	7.50	5.50a
CI 10003	Thatcher	71.87b	61.10	178.50b	45.75a	86.75a	4.00	93.75a	9.00a	.00	.00b
RL 4238	Manitou*2/RL4124.1	68.50b	59.00	178.50b	44.25a	62.00	2.50	.00	.00b	3.75	1.25b
	\bar{x}	89.44	60.83	180.79	39.31	59.12	3.07	16.89	3.19	5.36	3.02
	F _{2/}	8.15**	.00	28.99**	46.42**	3.74**	5.68**	17.78***	34.70**	12.17**	10.68**
	S.E. \bar{x}	3.62	.00	.31	.71	15.47	.89	6.29	.58	2.26	.52
	L.S.D. (.05)	10.17	.00	.87	1.99	43.45	2.49	17.67	1.64	6.34	1.46
	C.V. %	4.05	.00	.17	1.81	26.17	28.86	37.24	18.24	42.15	17.13

Table 1 (con't)

- 1/ Check variety
- 2/ Value for variety comparison
- Indicates statistical significance at .05 level
- ** Indicates statistical significance at .01 level
- a Values significantly greater than the check .05 level
- b Values significantly less than the check .05 level

Table 2. Summary of dryland hard red spring wheat yields for the advanced yield nursery grown at the Northwestern Agricultural Research Center, Kalispell, Montana, 1965-74.

C. I. or State No.	Variety	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	Ave.	Sta. Yrs.	% Thatcher
CI 10003	Thatcher	65.4	62.2	60.6	63.4	69.5	55.5	72.5	64.7	55.0	71.9	64.1	10	100
CI 13333	Wells	58.4	67.9	62.8	63.1	64.8	53.7	66.8	54.1	49.9	83.8	62.5	10	98
CI 12974	Centana	61.1	50.4	54.5	66.1	61.9	52.8	71.1	57.0	55.6	74.0	60.5	10	94
CI 13775	Manitou	62.2	67.5	57.5	57.6	70.7	66.9	67.1	61.5	53.8	77.5	64.2	10	100
CI 13596	Fortuna		66.2	56.4	74.7	88.9	41.9	76.8	56.2	60.5	81.9	67.1	9	105
CI 15233	Shortana				71.8	71.9	80.2	70.6	87.4	59.3	97.8	77.0	7	119
CI 13986	Era					93.1	82.2	90.0	96.1	69.6	102.9	89.0	6	137
CI 15927	Norana							90.8	87.6	69.7	98.4	86.6	4	131
MT 7156	SI/3/Nrn10/Bvr14//5*Cnt								83.9	72.7	99.1	85.2	3	133
MT 7031	JT/3/Nrn10/Bvr14//4*Cnt								80.1	62.8	91.2	78.0	3	122
MT 711	Fortuna/62-85								71.9	67.3	88.6	75.9	3	119
MT 738	Nrn10/Bvr14//6*Cnt/3/SI									75.1	101.5	88.3	2	139
S 6914	S6579/S659									66.4	76.1	71.3	2	112
MT 7145	Weibulls 7327/Cnt									63.2	88.2	75.7	2	119
MN 6433	II/55-14/II-60-105									61.5	88.7	75.1	2	118
RL 4238	Manitou*2/RL4124.1									58.7	68.5	63.6	2	100
MT 7350	Cajeme 71										109.5	109.5	1	152
CI 17267	Borah										102.9	102.9	1	143
MT 735	Nrn10/Bvr14//6*Cnt/3/SI										98.2	98.2	1	137
CI 15926	Wared										98.0	98.0	1	136
MT 7312	Nrn10/Bvr14//6*Cnt/3/SI										96.2	96.2	1	134
MT 7310	Nrn/Bvr14//6*Cnt/3/SI										93.8	93.8	1	130
CI 15892	Ward (Durum)										93.4	93.4	1	130
MT 739	Nrn10/Bvr14//6*Cnt/3/SI										92.9	92.9	1	129
MT 737	Nrn10/Bvr14//6*Cnt/3/SI										90.3	90.3	1	126
MT 734	Nrn10/Bvr14//6*Cnt/3/SI										90.2	90.2	1	125
MT 7313	Nrn10/Bvr14//6*Cnt/3/SI										89.6	89.6	1	125
CI 15930	Olaf										84.8	84.8	1	118
CI 17286	Tioga										80.9	80.9	1	113
CI 1789	Ellar										75.7	75.7	1	105