

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 3. Agronomic data from the western regional spring wheat nursery grown at Kalispell, Montana in 1974. Random block design, 4 replications. Field No. Y-4.

Date Seeded: April 23, 1974 Date Harvested: September 13, 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.	Type	%
ID 94	Aberdeen 6535-114-5-4-2	111.91a	59.60	184.75	38.00	78.75	6.75	4.00b	8.25	1.50	.50
CI 17268	Fielder	108.76a	59.50	182.25	38.50a	39.75	3.50b	26.25b	9.00	3.00a	7.50a
ID 87	Aberdeen 6535-114-5-5-1	107.19a	60.80	183.75	39.75a	68.25	5.25	5.25b	6.75b	3.00a	2.00
ID 47	Sonora 64/Winalta	106.99a	58.00	181.00b	34.50	88.25	7.75	6.50b	6.75b	4.00a	9.25a
WA 5952	NS 3880-227/CI 13438	105.13a	59.00	181.25b	39.25a	74.50	4.00b	33.75b	6.00b	3.00a	2.00
WA 6019	NS 3880-227/13438//13735	104.43a	60.00	182.75	40.50a	84.25	1.50b	52.50b	7.25	.75	1.25
WA 5936	NS 3880-227/13438//WA4468	102.58a	58.00	183.25	34.25	62.00	1.25b	5.50b	4.75b	.75	.25
UT 498259	UT 256-7-21-4/Pilot	100.66a	56.90	180.75b	31.75b	77.25	4.50b	37.50b	8.00	6.00a	21.25a
WA 5938	NS 3880-227/CI13438	100.06a	60.90	181.25b	38.75a	84.25	1.50b	15.25b	2.00b	.00	.00
WA 6018	NS 3880-227/13438//13735	99.43a	58.60	184.25	38.00	67.25	3.75b	33.75b	5.25b	3.00a	3.00
UT 498327	UT 256-7-21-4/Pilot	96.23	58.50	179.25b	31.50b	99.00	1.25b	33.75b	6.75b	4.50a	11.25a
UT 498263	UT 256-7-21-4/Pilot	94.23	54.80	182.25	30.75b	37.25	1.75b	97.00	8.25	.00	.00
UT 49813	UT 256-7-21-4/Pilot	92.56	59.00	183.25	32.00b	54.75	3.75b	94.75	9.00	2.25a	4.00
ID 65	L66/3/YT54A*4//Nrn10/Bvr	91.63	58.90	185.75a	38.50a	72.50	6.75	52.50b	7.50	.00	.00
CI 17267	Borah	89.53	57.90	177.50b	31.75b	74.25	1.50b	9.00b	3.00b	.00	.00
ID 67	Twin/CI 13977	88.88	55.70	183.00	35.75	90.75	3.50b	95.75	9.00	.00	.00
ID 725073	N10/St//ID/3/ID59/4/Lm66	88.85	59.00	182.00b	37.25	86.75	6.75	95.75	9.00	.00	.00
MT 7156	SI/3/Nrn10/Bvr14//5*Cnt	88.60	59.00	182.25	33.50b	7.50	2.50b	4.25b	5.00b	2.75a	1.75
ID 725071	Nrn10/St//Idd/3/Idd59	86.43	60.50	180.75b	43.50a	62.25	3.00b	90.00	9.00	2.50a	.50
ID 725075	Idaed 59/4*Lemhi 62	85.50	56.30	183.00	43.25a	99.00	6.75	93.50	9.00	.00	.00
CI 14588	Twin - ID 0015-1	81.08	52.50	183.50	36.00	62.25	7.25	95.75	9.00	.00	.00
ID 725077	Idaed 59/4*Lemhi 62	79.78	58.20	184.00	45.50a	84.75	7.00	67.50b	9.00	3.00a	1.75
WA 7022	Marfed/Druchamp, 68-1	76.68	59.60	184.50	44.00a	74.25	.75b	93.75	9.00	.00	.00
ID 725078	Idaed 59/4*Lemhi 62	76.35	57.00	183.00	43.75a	72.25	6.25	90.00	9.00	.00	.00
WA 5876	Gaines/Marfed, S68-3	73.82	54.00	186.50a	36.75	72.50	5.75	95.75	9.00	1.25	.25
CI 4734	Federation	66.97b	53.20	183.50	44.25a	61.00	5.50	92.50	9.00	9.00a	6.50a
ID 725076	Idaed 59/4*Lemhi 62	65.42b	55.70	184.50	45.00a	99.00	7.25	80.00	9.00	.00	.00
	\bar{x}	91.47	57.82	182.73	38.01	71.65	4.33	55.62	7.50	1.86	2.70
	$F^2/$	4.82**	.00	16.60**	36.86**	1.87NS	9.92**	26.56**	8.15**	10.80**	6.69**
	S.E. \bar{x}	5.86	.00	.47	.76	14.85	.73	7.24	.70	.68	1.87
	L.S.D. (.05)	16.44	.00	1.33	2.12	41.63	2.04	20.31	1.96	1.90	5.23
	C.V. %	6.41	.00	.26	1.99	20.73	16.82	13.03	9.34	36.36	69.03

Table 3 . (con't)

1/ Check variety

2/ Value for variety comparison

* Indicates statistical significance .05 level

** Indicates statistical significance .01 level

a Values significantly greater than the check .05

b Values significantly less than the check .05

Table 4. Summary of the western regional spring wheat nursery grown at the North-western Agricultural Research Center, Kalispell, MT, 1968 thru 1974.

C.I. or State No.	Variety	1968	1969	1970	1971	1972	1973	1974	Sta. Yrs.	% Twin
CI 4734	Federation	54.1	55.2	18.4	51.3	65.3	69.4	69.4	7	70
CI 14588	Twin	71.9	95.5	64.3	82.6	86.4	95.5	81.1	7	100
CI 17268	Fielder				106.0	93.4	94.8	108.8	4	117
CI 17267	Borah				89.2	88.3	93.1	89.5	4	104
WA 5938	NS3880-227/CI13438					95.4	82.1	100.1	3	106
WA 5876	Gaines/Marfed, S68-3					80.9	86.1	73.8	3	92
ID 47	Sonora 64/Winalta						94.1	107.0	2	114
WA 6019	NS3880-227//3438// 13735						92.6	104.4	2	112
WA 5936	NS3880-227/13438// WA4468						91.7	102.6	2	110
UT 498259	UT256-7-21-4/Pilot						88.4	100.7	2	107
WA 6018	NS3880-227/13438// 13735						85.3	99.4	2	105
UT 498327	UT256-7-21-4/Pilot						89.6	96.2	2	105
UT 498263	UT256-7-21-4/Pilot						91.4	94.2	2	105
UT 49813	UT256-7-21-4/Pilot						83.1	92.6	2	99
ID 65	L66/3/YT54A*4// Nrn10/Bvr						92.3	91.6	2	104
ID 67	Twin/CI 13977						98.6	88.9	2	106
ID 725073	N10/ST//ID/3/ID59/ 4/Lm66						89.7	88.9	2	101
ID 725071	Nrn10/ST//Idd/3/Idd59						74.1	86.4	2	91
ID 725075	Idaed 59/4*Lemhi 62						85.4	85.5	2	97
ID 725077	Idaed 59/4*Lemhi 62						77.7	79.8	2	89
ID 725078	Idaed 59/4*Lemhi 62						80.9	76.4	2	89
ID 725076	Idaed 59/4*Lemhi 62						78.2	65.4	2	81
ID 94	Aberdeen 6535-114-5-4-2							111.9	1	138
ID 87	Aberdeen 6535-114-5-5-1							107.2	1	132
WA 5952	NS 3880-227/CI 13438							105.1	1	130
MT 7156	SI/3/Nrn10/Bvr14//5*Cnt							88.6	1	109
WA 7022	Marfed/Druchamp, 68-1							76.7	1	95