

TITLE: Spring Wheat
PROJECT: Small Grains Investigation MS 756
YEAR: 1975
PERSONNEL: Leader - Vern R. Stewart
 Research Technician - Nancy Campbell
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 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.

1975 EXPERIMENTS:

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

1975 RESULTS BY NURSERY:

Advanced Yield Nursery - The mean yield for the nursery was 78.45 bu/a, which is less than the 1974 mean of 89.44 bu/a. Six entries had yields significantly greater than the check, Norana. No entries had yields significantly less than Norana. Test weights were low this year, some germination had occurred prior to harvesting. MT 749, the highest yielder, and MT 7340 had the highest test weights of 60.0 lbs/bu. Many entries had heading dates significantly earlier than Norana. Lodging was fairly severe this year with a mean lodging severity of 6.02 compared with 3.07 last year. Rainy weather prior to harvest accentuated these conditions. No entries were significantly greater than Norana, but four had lodging severity's significantly less than Norana. Leaf and stripe rust readings tend to be lower this year than last. Table 1.

In the ten year summary only one variety, MT 741, has yielded less than the check, Thatcher. All the other varieties have outyielded Thatcher. Table 2.

Western Regional Spring Wheat Nursery - Yields tend to be lower this year than last year. Twenty varieties had yields significantly less than the check, Fielder. No varieties were significantly greater than Fielder. There were 16 soft white, 1 hard white and 11 hard red varieties. In comparing the red and white varieties, it was found that the reds average yield was higher than the white; 81.75 bu/a and 73.45 bu/a respectively. Test weights for all varieties were low, some germination had occurred prior to harvest. The mean test weight was 53.62. Lodging severity readings were more critical this year. The lodging severity mean last year was 4.33 compared to 6.91 this year. The rainy conditions before harvest helped increase the amount of lodging. Five entries had lodging severities significantly less than Fielder. Table 3.

In the summary of yields over several years Fielder was used as a check. No variety had a higher yield average than Fielder. Table 4.

Spring Wheat (con't)

Private Variety Nursery - This nursery contains lines and varieties developed by commercial companies which were compared to several established varieties used as checks. Norana was used as a check for statistical purposes. Only one variety, MT 41 a private entry, was significantly greater in yield than Norana. Test weights were low in all entries with Profit 75 having the highest at 58.80 lbs/bu. There was some germination prior to harvest. Table 5.

Flag Leaf Nursery - This nursery will be included in the Wheat Report as pertains to its significance. Dr. F. H. McNeal will write this report. Table 6 shows agronomic data collected for this study.

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 Varieties

1. Twin - non irrigated and irrigated
2. Fielder - irrigated and non 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

Recommended Varieties (con't)

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 Varieties

1. Twin (to be removed in 1977)

- 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

2. 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

VARIETY TO BE CONSIDERED FOR RECOMMENDATION

Hard Red Spring

1. 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 nursery grown at Kalispell, Montana in 1975. Random block design, four replication.

Date seeded: May 9, 1975 Date harvested: September 22, 1975 Size of plot: 16 sq. ft.

Co. or State No	Variety	Yield Bu/A	Test Wt Lbs/Bu	Heading Date	Plant Height	Lodging		% Leaf Rust	Stripe Rust	
						Prev. %	Sev.		Sev.	Prev. %
MT 749	REDR68-SI/3/N10/B14//5*C	96.66a	60.00	189.75b	33.25	65.00	5.50	1.25	.00b	.00
CI 17267	Borah	95.01a	57.10	189.75b	30.25b	87.50a	6.00	.00	.00b	.00
MT 7416	REDR68/3/N10/B14//6*CNT	89.98a	58.10	189.50b	33.25	75.00a	5.75	1.25	2.50	3.75
MT 7418	REDR68/3/N10/B14//6*CNT	89.90a	59.40	189.75b	35.00	60.00	4.00b	.00	.00b	.00
MT 738	NRN10/BVR14//6*CNT/3/SI	88.08a	58.60	192.00	35.50	45.00	6.25	1.25	3.75a	5.00
MT 7336	PK176/Sheridan	86.43a	59.40	189.75b	33.25	30.00	6.25	2.50	1.00	1.25
MT 7156	SI/3/NRN10/BVR14//5*CNT	85.23	58.40	191.75	32.00	45.00	6.25	.00	.00b	.00
CI 13986	Era	84.65	56.20	193.00	32.25	70.00	7.75	.00	.75	1.25
MT 737	NRN10/BVR14//6*CNT/3/SI	83.30	59.50	191.00b	37.25a	32.50	4.50b	.00	1.75	2.50
CI 15930	Olaf	82.58	57.10	190.00b	34.75	45.00	5.75	.00	.00b	.00
MN 6433	II-55-14/II-60-105	81.90	56.30	191.75	34.25	70.00	7.25	.00	3.25	5.00
MT 7421	REDR68/3/N10/B14//6*CNT	80.90	59.40	190.75b	35.50	40.00	4.75b	1.25	.00b	.00
MT 747	REDR68-SI/3/N10/B14//5*C	80.45	58.30	189.00b	32.00	58.75	6.50	1.25	1.75	2.50
MT 7340	S6579//55-11/57-62	79.73	60.00	191.75	41.25a	63.75	6.00	.00	3.50	6.25
CI 17282	Crosby	79.55	57.70	189.75b	43.25a	72.50	5.75	.00	2.75	5.00
MT 734	NRN10/BVR14//6*CNT/3/SI	79.33	56.50	191.50	37.00a	62.50	5.50	.00	2.00	3.75
CI 13333	Wells	78.78	59.20	192.25	47.00a	82.50a	6.50	.00	4.50a	6.25
CI 15892	Ward (Durum)	77.83	59.30	190.75b	41.50a	17.50	4.25b	.00	3.25	3.75
MT 7313	NRN10/BVR14//6*CNT/3/SI	76.85	57.90	191.25	37.50a	47.50	6.50	.00	1.25	2.50
CI 17289	Ellar	75.20	58.40	189.00b	39.00a	40.00	5.25	1.25	.75	1.25
CI 15926	Wared	74.12	56.10	193.00	33.25	66.25	7.00	2.50	.50	1.25
CI 15927	Norana (MT 7042) ^{1/}	72.67	56.90	192.75	33.75	43.75	6.75	.00	2.00	3.75
MT 746	REDR68-SI/3/N10/B14//5*C	72.22	58.40	190.25b	34.00	60.00	6.50	1.25	.00b	.00
CI 13775	Manitou, R.L. 4159	69.30	57.20	189.50b	40.25a	77.50a	5.75	1.25	.00b	.00
CI 13596	Fortuna	68.90	57.30	190.75b	41.25a	78.75a	6.00	1.25	1.50	2.50
MT 744	FTA-B529 1/3/N10/B14//4*C	68.15	56.00	190.25b	37.25a	72.50	6.50	.00	2.00	3.75
CI 10003	Thatcher	65.95	57.20	190.25b	40.75a	65.00	6.00	10.00a	.00b	.00
MT 711	Fortuna/62-85	65.32	58.60	193.25	39.75a	83.75a	7.25	.00	.00b	.00
CI 17286	Tioga	63.30	58.10	191.50	42.50a	68.75	6.25	.00	6.25a	41.25a
MT 741	FTA/4/SI/3/N10/B14//5*CN	61.20	56.20	190.25b	33.50	77.50a	6.50	.00	.00b	.00

Table 1 . (con't)

	Yield	Test Wt.	Heading	Plant	Lodging		% Leaf	Stripe Rust	
	Bu/A	Lbs/Bu	Date	Height	Prev.	Sev.	Rust	Sev.	Prev.%
\bar{x}	78.45	57.96	190.86	36.71	60.13	6.02	.87	1.50	3.42
$F^2/$	3.74**	.00	24.92**	25.92**	2.97**	3.14**	3.44**	7.65**	8.69**
S.E. \bar{x}	4.72	.00	.25	.80	10.27	.49	1.02	.59	2.52
L.S.D. .05	13.26	.00	.69	2.26	28.84	1.37	2.86	1.66	7.09
C.V. %	6.02	.00	.13	2.19	17.08	8.09	116.47	39.37	73.88

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

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, Kalispell, Montana, 1966-1975.

C.I. or State No.	Variety	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	Ave.	Sta. Yrs.	% Thatcher
CI 10003	Thatcher	62.2	60.6	63.4	69.5	55.5	72.5	64.7	55.0	71.9	65.9	64.1	10	100
CI 13333	Wells	67.9	62.8	63.1	64.8	53.7	66.8	54.1	49.9	83.8	78.8	64.6	10	101
CI 13775	Manitou	67.5	57.5	57.6	70.7	66.9	67.1	61.5	53.8	77.5	69.3	64.9	10	101
CI 13596	Fortuna	66.2	56.4	74.7	88.9	41.9	76.8	56.2	60.5	81.9	68.9	67.2	10	105
CI 13986	Era				93.1	82.2	90.0	96.1	69.6	102.9	84.7	88.4	7	136
CI 15927	Norana						90.8	87.6	69.7	98.4	72.7	83.8	5	127
MT 7156	SI/3/NRN10/BVR14//5*CNT							83.9	72.7	99.1	85.2	85.2	4	132
MT 711	Fortuna/62-85							71.9	67.3	88.6	65.3	73.3	4	114
CI 17286	Tioga							62.7	58.6	80.9	63.3	72.6	4	113
MT 738	NRN10/BVR14//6*CNT/3/SI								75.1	101.5	88.1	88.2	3	137
MN 6433	II/55-14/II-60-105								61.5	88.7	81.9	77.4	3	120
CI 17267	Borah								69.5	102.9	95.0	89.1	3	139
CI 15930	Olaf								58.0	84.8	82.6	75.1	3	117
CI 1789	Ellar								59.6	75.7	75.2	70.2	3	109
CI 15926	Wared									98.0	74.1	86.1	2	125
CI 15892	Ward (Durum)									93.4	77.8	85.6	2	124
MT 737	NRN10/BVR14//6*CNT/3/SI									90.3	83.3	86.8	2	126
MT 734	NRN10/BVR14//6*CNT/3/SI									90.2	79.3	84.7	2	123
MT 7313	NRN10/BVR14//6*CNT/3/SI									89.6	76.9	83.2	2	121
MT 749	REDR68-SI/3/										96.7	96.7	1	147
MT 7416	REDR68/3/N10										90.0	90.0	1	137
MT 7418	REDR68/3/N10										89.9	89.9	1	136
MT 7336	PK176/SHER10										86.4	86.4	1	131
MT 7421	REDR68/3/N10										80.9	80.9	1	123
MT 747	REDR68-SI/3/										80.5	80.5	1	122
MT 7340	S6579//55-11										79.7	79.7	1	121
CI 17282	Crosby										79.6	79.6	1	121
MT 746	REDR68-SI/3/										72.2	72.2	1	110
MT 744	FTA-B529 1/3/										68.1	68.1	1	103
MT 741	FTA/4/SI/3/N										61.2	61.2	1	93