TITLE: Spring Wheat

PROJECT: Small Grains Investigation MS 756

YEAR: 1975

PERSONNEL: Leader - Vern R. Stewart
Research Technician - Nancy Campbell
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.

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 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 lose 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 3. Agronomic data from the Western Regional Spring Wheat nursery grown at Kalispell, Montana in 1975. Field No. Y-5. Random block design, four replications.

Date seeded: May 9, 1975 Date harvested: September 15, 1975 Size of plot: 16 sq. ft.

C.I. or State No	Variety	Yield Bu/A	Test Wt Lbs/Bu	Heading Date	Plant Height Inches	Lodging Prev.	Lodging Sev.	% Leaf Rust	Powdery Mildew	Stripe Rust Type	Stripe Rust Prev.
WA 6019	NS 3880-227/13438//13735	95.63	56.30	192.75b	38.50a	62.50	6.00b	11.25	3.50a	.50b	1.25
CI 17268	Fielder[2/]	95.51	56.70	193.50	35.00	77.50	7.25	1.25	1.75	4.00	5.00
CI 17267	Borah	94.36	57.00	190.00b	30.50b	66.25	6.00b	2.50	1.50	.00b	.00
UT498165	UT256-7-21-4/Pilot	89.48	53.70	193.25	30.25b	75.00	6.50	6.25	1.50	.00b	.00
ID 47	Sonora 64/Winalta	89.18	55.60	192.00b	33.50	82.50	7.25	2.50	5.00a	1.50b	2.50
MT 7156	SI/3/NRN10/BVR14//5*CNT	89.03	58.50	193.00	33.50	52.50b	6.50	.00	1.00	1.50b	3.75
WA 6101	LRN 10/BVR11//P14/3/101	86.28	53.80	198.00a	36.25	77.50	7.50	.00	6.25a	.00b	.00
WA 6105	HRY/KRN//AO/HRPC/3/13730	83.60	54.00	192.00b	37.75a	82.50	6.25	1.25	1.50	.00b	.00
WA 6100	LRN 10/BVR11//P14/3/101	83.25b	53.40	198.00a	34.50	55.00b	6.75	.00	5.50a	.00b	.00
ID725073	N10/ST//ID/3/ID59/4/LM66	81.70b	54.90	192.50b	37.00	85.00	6.75	11.25	2.75	.75b	6.25
WA 6018	NS 3880-227/13438//13735	81.38b	56.80	193.75	36.25	36.25b	5.75b	5.00	3.75a	.00b	.00
ID 106	Twin/Triple Dirk	81.23b	52.40	193.00	34.50	80.00	7.50	1.25	1.00	.00b	.00
UT498327	UT256-7-21-4/Pilot	78.73b	54.00	190.75b	30.25b	57.50b	6.00b	6.25	4.25a	4.00	36.25a
ID 87	Aberdeen 6535-114-5-5-1	78.60b	56.20	195.75a	37.25a	88.75	8.00	1.25	1.75	.00b	.00
ID 107	TZPP/3*AN//B61-136	78.18b	56.70	192.50b	35.75	85.00	6.25	.00	1.00	.50b	1.25
ID725078	Idaed 59/4*Lemhi 62	76.78b	53.20	194.00	42.75a	86.25	7.00	11.25	1.50	.75b	6.25
WA 6158	HRY/KRN//AO/HRPC/3/13730	75.60b	54.90	193.75	39.25a	67.50	6.00b	1.25	1.50	.75b	1.25
ID725071	NRN10/ST//IDD/3/IDD59	74.15b	58.30	191.25b	40.50a	71.25	6.50	7.50	2.75	1.50b	5.00
ID 94	Aberdeen 6535-114-5-4-2	73.67b	54.60	195.75a	37.50a	93.50	8.00	1.25	4.25a	.00b	.00
ID725075	Idaed 59/4*Lemhi 62	71.95b	52.40	193.75	42.00a	88.75	6.75	11.25	1.25	.50b	1.25
ID725076	Idaed 59/4*Lemhi 62	71.67b	51.20	194.75a	41.50a	82.50	7.25	11.25	1.25	.50b	1.25
UT498222	UT256-7-21-4/Pilot	71.62b	52.50	192.00b	31.75b	80.00	7.25	25.00a	5.75a	1.75b	3.75
UT498259	UT256-7-21-4/Pilot	68.10b	50.50	191.25b	29.50b	66.25	7.25	23.75a	5.00a	3.50	11.25
ID 105	Twin*3//227196/A63166S	64.52b	46.50	193.25	34.25	91.25	8.00	25.00a	1.00	.00b	.00
ID 104	SPF*3/3/ULKA/FR//LMK 66	64.27b	45.40	191.50b	32.00b	82.50	8.00	52.50a	2.25	.00b	.00
ID725077	Idaed 59/4*Lemhi 62	54.37b	54.60	194.50a	43.75a	87.50	7.25	13.75a	1.75	1.00b	2.50
WA 6157	N6600313/Twin	54.34b	47.00	196.00a	36.50	87.50	8.00	15.00a	7.25a	.50b	1.25
CI 4734	Federation	40.74b	50.40	195.25a	41.75a	67.50	6.00b	7.50	8.00a	4.75	13.75a
	$\bar{x}$[1/]	76.71	53.62	193.49	36.21	75.57	6.91	9.15	3.05	1.01	3.71
	F[1/]	9.17**	.00	57.31**	29.63**	3.76**	3.91**	6.59**	24.90**	6.03**	8.99**
	S.E.$\bar{x}$	4.27	.00	.26	.74	7.05	.37	4.44	.42	.57	2.42
	L.S.D.(.05)	12.01	.00	.74	2.09	19.83	1.03	12.49	1.18	1.59	6.81
	C.V. %	5.57	.00	.14	2.06	9.33	5.32	48.51	13.72	56.04	65.36

Table 3 . (con't)

1/ Value for variety comparison
2/ Check variety
* Indicates statistical significance at the .05 level
** Indicates statistical significance at the .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 Northwestern Agricultural Research Center, Kalispell, MT, 1971 thru 1975.

C.I. or State No	Variety	1971	1972	1973	1974	1975	Ave.	Sta. Yrs.	% Fielder
CI 4734	Federation	51.3	65.3	69.4	69.4	40.7	59.2	5	59
CI 17268	Fielder	106.0	93.4	94.8	108.8	95.5	99.7	5	100
CI 17267	Borah	89.2	88.3	93.1	89.5	94.4	90.9	5	91
ID 47	Sonora 64/Winalta			94.1	107.0	89.2	96.8	3	97
WA 6019	NS3880-227//3438//13735			92.6	104.4	95.6	97.5	3	98
UT498259	UT256-7-21-4/Pilot			88.4	100.7	68.1	85.7	3	86
WA 6018	NS3880-227/13438//13735			85.3	99.4	81.4	88.7	3	89
UT498327	UT256-7-21-4/Pilot			89.6	96.2	78.7	88.2	3	88
ID725073	N10/ST//ID/3/ID59/4/Lm66			89.7	88.9	81.7	86.8	3	87
ID725071	NRN10/ST//IDD/3/IDD59			74.1	86.4	74.2	78.2	3	78
ID725075	Idaed 59/4*Lemhi 62			85.4	85.5	72.0	81.0	3	81
ID725077	Idaed 59/4*Lemhi 62			77.7	79.8	54.4	70.6	3	71
ID725078	Idaed 59/4*Lemhi 62			80.9	76.4	76.8	78.0	3	78
ID725076	Idaed 59/4*Lemhi 62			78.2	65.4	71.7	71.8	3	72
ID 94	Aberdeen 6535-114-5-4-2				111.9	73.7	92.8	2	91
ID 87	Aberdeen 6535-114-5-5-1				107.2	78.6	92.9	2	91
MT 7156	SI/3/NRN10/BVR14//5*CNT				88.6	89.0	88.8	2	87
UT498165	UT256-7-21-4/Pilot					89.5	89.5	1	94
WA 6101	LRN10/BVR11//P 14/3/101					86.3	86.3	1	91
WA 6105	HRY/KRN//AO/HRPC/3/13730					83.6	83.6	1	88
WA 6100	LRN10/BVR11//P14/3/101					83.3	83.3	1	87
ID 106	Twin/Triple Dirk					81.2	81.2	1	85
ID 107	TZPP/3*AN//B61-136					78.2	78.2	1	82
WA 6158	HRY/KRN//AO/HRPC/3/13730					75.6	75.6	1	79
UT498222	UT256-7-21-4/Pilot					71.6	71.6	1	75
ID 105	Twin*3//227196/A63166S					64.5	64.5	1	68
ID 104	SPF*3/3/ULKA/FR//LMK66					64.3	64.3	1	67
WA 6157	N6600313/Twin					54.3	54.3	1	57