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TITLE: Spring Wheat

PROJECT: Small Grains Investigations MS 756

YEAR: 1970

PERSONNEL: Leader - Vern R. Stewart  
Cooperators - F. H. McNeal and M. A. Berg

LOCATION: Northwestern Montana Branch Station - Field No. Y-8. Off station locations as listed in the manuscript.

DURATION: Indefinite

OBJECTIVES:

1. To determine the adaptability of new introduced spring wheat varieties and selections by comparisons with recommended variety.
2. Study the semi-dwarf strains of spring wheat for use under irrigated conditions.
3. To aid in basic genetics research in spring wheat and the overall breeding program.

SIGNIFICANT FINDINGS:

1. In general, semi-dwarf types were higher in yield than standard varieties.
2. CA 6903, a semi-dwarf, was outstanding in the Western Regional Nursery.
3. CI 13736 was the highest yielding variety grown in Western Montana in 1970, but is very late in maturity which is a definite draw back.

FUTURE PLANS: To continue to evaluate spring wheat varieties. To aid in the total breeding program in Montana. To study semi-dwarf strains of spring wheat for irrigated conditions.

MATERIALS AND METHODS:

Standard nursery procedures were used in a variety testing program. Nurseries were grown in four row plots, four replications. A randomized block design was used for all nurseries. All station nurseries this season were located in Field Y-8 at the Northwestern Montana Branch Station. The nurseries grown were: Advanced Yield Nursery, containing 30 entries; the Western Regional White Spring Wheat Nursery, containing 27 entries; the Isogenic Height Level Nursery, 5 entries (four located off station) the Yield Component Yield Nursery, 27 entries and the Protein Yield Nursery, 18 entries. Tiller counts, kernels/head, 500 kernel weights were secured on the protein yield nursery and the yield component study. Tillers were counted in 16 linear feet of row and 25 heads selected at random were used to determine seeds per head. Four off station nurseries consisting of 16 entries were seeded in Lake, Missoula, Sanders and Ravalli Counties.

All studies were harvested with a small power harvester and threshed with a nursery type thresher (Vogel).

RESULTS AND DISCUSSION:Advance Yield Nursery

Twenty entries in this nursery were significantly higher in yield than Sheridan which was used as the check. The semi-dwarf types were for the most part the highest yielding lines and lodging resistance was excellent in most of the semi-dwarf lines except Pitic 62, MT 6539 and Bonanza. Nine entries all semi-dwarf exceeded 80 bushels per acre in this study. Severe early lodging in Fortuna and Sheridan no doubt accounts for the low yields in these two varieties. Based on agronomic data MT 6903, MT 6902, MT 6865, MT 6868 and MT 6723 are entries that should be given additional consideration. None of the commercial entries were outstanding in performance, however Bonanza a DeKalb entry was the highest yielding of this group. Table 1.

A summary of 10 years data of the Advance Yield nursery is given in Table 2. The semi-dwarf are far superior to Sheridan and Thatcher for the most part. Fortuna is 119 percent of Sheridan, 109 of Thatcher, based on 6 years data. For the three year period MT 6723 is 130 percent of Sheridan and 118% of Thatcher, Era for a 2 year period is 140% of Thatcher and 149% of Sheridan. These two varieties have real possibility for use in Western Montana.

Western Regional White Wheat Nursery

CA 6903 is the high yielding entry in this nursery and has a maturity date similar to Idaed 59, and is highly resistant to lodging. Springfield (ID 0019) and ID 0015 were lower in yield than last year. ID 0015 was very late and had a very low test weight. Springfield (ID 0019) has fair test weight, but did not out yield Idaed in this years nursery. Lodging and stripe rust were severe, however rust rates were not recorded. Table 3.

In Table 4 is found data for ten years on wheats grown in the Western Regional Nursery. Varieties are compared with Lemhi and also with Idaed 59. There are several entries that are far superior to the checks in yield. Maturity of varieties is a critical factor in many of the entries, however these data are not included in Table 4.

Off Station

Of the four nurseries planted only two were harvested. The nursery in Missoula County was dropped because of a high infestation of Canada thistle. The nursery in Sanders County was not harvested because of uneven stands and growth. This was due in part to a soil condition and inadequate irrigation.

Ravalli County

In this location ID 0015 was the leading entry for yield, but had a very low test weight due to the lateness in maturity. This nursery was harvested a little on the green side, however Sheridan had a good test weight. Table 5.

## Results and Discussion (con't)

Lake County

ID 0015 was high in this location as it was in Ravalli County. Test weights were low in both ID 0015 and ID 0019, but ID 0019 is a slight bit higher. Five entries were significantly higher in yield than the variety Sheridan. Table 6.

In 1970 the top three yielding varieties were CI 14555, CI 13736 and Pitic 62. All three were low in test weight and quite late in maturity. CI 13736 was very late as was Pitic 62. Table 7.

Isogenic Height Nurseries

Significant results were obtained in two of the four nurseries. At the station the medium types were significantly higher in yield than Centana and in Ravalli County the medium types were highest in yield but only one bushel higher than Centana. The nurseries in Sanders and Lake Counties were not significantly different in yield.

Plant heights were all found to vary significantly at all locations as would be expected with this material.

Kernel weights were significantly different in all locations. Medium is the heaviest of the entries. Complete data for these studies are seen in Table 8 thru 11. Table 12 gives a summary of these data.

Table 1. Agronomic data from the advanced yield nursery grown at the Northwestern Montana Branch Station, Route 4, Kalispell, in 1970. Field No. Y-8. Experimental design - random block, four reps.

Planting Date: May 6, 1970  
Harvest Date: September 10, 1970  
Size of Plot: 16 sq. ft.

CI or State #	Variety	Yield Bu/A	Test Wt Lbs/Bu.	Days Jan 1 to Heading	Plant Height	Lodging	
						% Prev.	Sev. 0-9
MT 6903	Si/3/Nrn10/Bvr14//5*Cnt	87.68*	58.1	185b	37.0b	0.0b	0.0b
ID 0018	Tzpp/Sonora 64	85.68*	56.6	185b	39.3b	27.5b	2.0b
MT 6902	7327/3/N10/Bvr14//5*Cnt	85.03*	57.2	187a	38.3b	0.0b	0.0b
MT 6865	B52-91/3/N10/BL4//4*Cnt	84.65*	55.1	184b	38.0b	0.0b	0.0b
MT 6868	B52-91/3/N10/BL4//4*Cnt	84.05*	57.2	185b	37.0b	0.0b	0.0b
CI 13927	Pitic 62	82.48*	54.3	189a	38.5b	78.8	6.3
CI 13986	Era	82.23*	58.8	187a	36.5b	10.0b	2.5b
MT 6839	Ftr/3/Nrn10/Bvr14//5*Cnt	80.25*	58.2	187a	39.5b	71.0	4.0b
MT 6723	Nrn10/Bvr14//6*Cnt	80.23*	58.2	186	35.8b	0.0b	0.0b
DK 1	Bonanza	79.70*	58.2	185b	33.8b	71.0	7.8
CI 13985	Fletcher	78.03*	57.7	188a	36.0b	10.0b	1.0b
SB 8	Dekalb SB8	77.23*	59.0	185b	35.8b	0.0b	0.0b
MT 6901	Ceres/3/N10/Bvr14//4*Cnt	75.47*	56.2	186	39.0b	20.0b	2.0b
MT 6830	Si/3/Nrn10/Bvr14//5*Cnt	74.05*	56.3	184b	37.0b	0.0b	0.0b
ND 6579	Fta/61-107, S6579	71.32	57.9	185b	42.8b	62.0b	4.0b
MT 6834	Si/3/Nrn10/Bvr14//5*Cnt	70.60*	56.4	185b	39.3b	42.3b	2.0b
RL 4200	Neepawa	70.40*	57.4	185b	43.5b	15.0b	2.0b
CI 13958	Waldron	67.10*	55.4	184b	44.0b	32.5b	2.8b
CI 13775	Manitou, R.L. 4159	66.92*	57.4	185b	44.3b	51.0b	5.3b
MT 6905	B59-3/Sheridan	66.22*	53.6	186	40.0b	85.8	8.3
WO 1812	World Seeds 1812	65.95*	56.9	184b	31.0b	46.0b	.5b
CI 13768	Leeds	64.00*	58.6	185b	48.0	69.5	6.8
WO 1809	World Seeds 1809	60.57*	54.2	180b	31.3b	84.5	7.5
SB 6	Dekalb SB6	57.74*	52.9	180b	31.5b	63.5b	6.3
MT 6851	B52-91/Ftr	55.89	55.7	186	47.0	80.8	5.5b
CI 10003	Thatcher	55.47	56.3	185b	42.8b	98.0	4.0b
CI 13333	Wells	53.67	54.6	186	48.8	99.0	8.5
CI 12974	Centana	52.77	57.1	187a	45.3b	94.3	7.5
CI 13773	Polk	50.22	57.5	186	46.5	82.3	6.3
CI 13586	Sheridan <sup>1/</sup>	45.72	55.6	186	47.8	99.0	9.0
CI 13596	Fortuna	41.86	51.0	186	43.3b	99.0	8.8
MT 681	Nrn10/Bvr14//Cnt/3/4*RS	38.64	47.9	186	36.0b	99.0	8.0
MT 6812	Nrn10/Bvr14//Cnt/3/4*RS	35.66	47.9	186	41.0b	99.0	8.0

<sup>1/</sup> Check variety  
\* Varieties yielding significantly more than the check (.05)  
a Values significantly more than the check  
b Values significantly less than the check

$\bar{x}$	67.5	55.9	185.2	39.8	51.2	4.1
F - Value for variety comparison	12.82**	0.0	24.14**	31.15**	10.75**	10.51**
S.E. $\bar{x}$	4.13	0.0	3.6	.88	11.66	1.0
L.S.D. (.05)	11.57	0.0	1.02	2.48	32.69	2.80
C.V.%	6.12	0.0	.20	2.22	22.76	24.19

Table 2. Summary of dryland hard red spring wheat yields for the advanced yield nursery grown at the North-western Montana Branch Station, Route 4, Kalispell, Montana from 1961-1970.

CI or State No.	Variety	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	Sta. Yrs.	% Thatcher	% Sheridan
CI 10003	Thatcher	27.4	49.7	34.7	46.7	65.4	62.2	60.6	63.4	69.5	55.5	10	100.0	99.3
CI 13586	Sheridan	38.5	59.4	36.9	50.6	76.8	50.9	54.5	54.4	71.7	45.7	10	100.8	100.0
CI 12974	Centana	28.3	59.1	34.3	47.8	61.1	50.4	54.5	66.1	61.9	52.8	10	96.5	95.7
CI 13333	Wells		52.6	33.7	57.1	50.4	67.9	62.8	63.1	64.6	53.7	9	101.2	102.5
CI 13775	Manitou, R.				50.8	62.2	67.5	57.5	57.6	70.7	66.9	7	102.3	107.1
CI 13596	Fortuna				62.9		66.2	56.4	74.7	88.9	41.9	6	109.2	119.4
CI 13768	Leeds						55.8	58.1	58.2	49.4	64.0	5	91.8	103.1
CI 13773	Polk						51.4	52.3	57.2	64.3	50.2	5	88.5	99.5
MT 6723	Nrn10/Bvr14								71.8	71.9	80.2	3	118.8	130.2
CI 13986	Era									93.1	82.2	2	140.2	149.4
CI 13927	Pitic 62									101.1	82.5	2	146.9	156.4
ND 6579	Fta/61-107,									90.9	71.3	2	129.8	138.2
MT 6839	Ftr/3/Nrn10									80.9	80.3	2	129.0	137.3
MT 6830	Si/3/Nrn10/									87.0	74.0	2	128.8	137.1
MT 6834	Si/3/Nrn10/									86.7	70.6	2	125.8	133.9
RL 4200	Neepawa									74.2	70.4	2	115.7	123.2
CI 13958	Waldron									62.0	67.1	2	103.3	110.1
MT 6903	Si/3/Nrn10/										87.7	1	158.0	191.9
ID 18	Tzpp/Sonora										85.7	1	154.4	187.5
MT 6902	7327/3/N10/										85.0	1	153.2	186.0
MT 6865	B52-91/3/N1										84.7	1	152.6	185.3
MT 6868	B52-91/3/N1										84.1	1	151.5	184.0
DK 1	Bonanza										79.7	1	143.6	174.4
CI 13985	Fletcher										78.0	1	140.5	170.7
SB 8	Dekalb SB8										77.2	1	139.1	168.9
MT 6901	Ceres/3/N10										75.5	1	136.0	165.2
MT 6905	B59-3/Sheri										66.2	1	119.3	144.9
WO 1812	World Seeds										65.9	1	118.7	144.2
WO 1809	World Seeds										60.6	1	109.2	132.6
SB 6	Dekalb SB6										57.7	1	104.0	126.2
MT 6851	B52-91/Ftr										55.9	1	100.7	122.3
MT 681	Nrn10/Bvr14										38.6	1	69.5	84.5
MT 6812	Nrn10/Bvr14										35.7	1	64.3	78.1

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