TITLE: Small Grains Investigations

PROJECT: Spring Wheat ✓ MS 756

YEAR: 1968

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

LOCATION: Northwestern Montana Branch Station, Field No. Y-7

DURATION: Indefinite

OBJECTIVES:
1. To determine the adaptability of new introduced spring wheat varieties and selections by comparisons of recommended variety.
2. Study the semi-dwarf strains of spring wheat for use under irrigated conditions.
3. To determine the yield depression in inbreeding of certain lines of spring wheat.

SIGNIFICANT FINDINGS:

Fortuna has promise as a potential variety for Western Montana. The white wheats were not outstanding in performance in 1968.

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 the nurseries this season were located in Field Y-7 at the Northwestern Montana Branch Station. The nurseries grown were: Advance Yield Nursery, containing 30 entries; the Western Regional White Spring Wheat Nursery, containing 24 entries; the Semi-dwarf Dryland Yield Nursery, containing 30 entries and the Inbreeding Nursery consisting of 20 entries. The nurseries were sprayed with bromoxynil at the rate of 3/8 of a pound per acre for weed control. To control wire worm, 100 pounds of 10% DDT was applied October 5, 1967. One hundred pounds of 27-14-0 was also applied in October.

All studies were harvested with a power harvester. Complete agronomic data was obtained for each study.

RESULTS AND DISCUSSIONS:

Precipitation during the months of May, June, July and August was considerably above normal. Continued rain into September made harvest difficult. This accounts in part, for the light test weights and lodging in all nurseries.

RESULTS AND DISCUSSION (con't):

Advanced Yield Nursery: The highest yielding entry in the nursery was Montana 6722, a semi-dwarf. The test weight was 58 pounds, heading date is satisfactory for this area and lodging resistance was excellent. Sixteen entries were found to be significantly higher in yield than the variety Sheridan which is used as a check in the study. Fortuna and Red River 68 were in this group. All the durum entries included in the study in 1968 were in the lower yielding group. Complete tabulation of this nursery is found in Table 1.

Comparing Sheridan and Fortuna over a five year period we find that Fortuna is 119% of Sheridan. The semi-dwarfs are found to be from 115% up to 145% of Sheridan. These entries are also found to be somewhat superior to the variety Centana. Red River 68, a much publicized variety is 150% of Sheridan in 1968. (Table 2)

Western Regional White Spring Wheat Nursery: Aberdeen Sel. #0015 is the highest yielding entry, with a yield of 71.92 bu/a, which is 11.1 bu/a above the mean of 60.8 bu/a. These yields are somewhat lower than average for this area. Aberdeen Sel. #0015 has a good lodging resistance, but test weight is very light, which was probably influenced by the rainfall. It is interesting to note that the variety Lemhi is higher in yield than the check Idaed 59. This no doubt is due to the absence of stripe rust. CI 13981, CI 13736 and Aberdeen Sel. #006 show promise for use in western Montana, using yield and maturity date as measures. Lodging resistance is quite high in most of the entries at the higher yield levels. (Table 3)

In Table 4, is a summery of white spring wheat yields grown at the Northwestern Montana Branch Station 1958 thru 1968. Over the 10 year period there does not seem to be anything significant as related to the variety Idaed 59. CI 13981 over a three year period is 123% of Idaed 59, however in 1968 this entry was not significantly better in yield than Idaed 59. A summary of these data do not indicate any real potential varieties from this testing program to date.

Semi-dwarf Nursery: The mean yield was about 2 bu/a below the Advanced Yield Nursery grown in adjacent plots. Two entries were found to be significantly higher in yield than Sheridan. The semi-dwarf lines have from fair to excellent lodging resistance under severe conditions. Montana 6830 has an early maturing date some three days earlier than the variety Sheridan, which would be an asset to Western Montana wheat growing. (Table 5)

The data in Table 6 is made a part of this report for a permanent record. These data are part of an over all program conducted by F. H. McNeal and will be summarized from several locations. Most of these entries were quite late in maturity and have a low yield index. Lodging resistance was poor in this material.

Table 1. Agronomic data from the advanced yield spring wheat nursery, Northwestern Montana Branch Station, 1968, Field No. Y-7. Experimental design-random block, 4 replications.

Seeding Date: April 29, 1968
Harvest Date: September 10, 1968
Size of Plot: 16 sq. ft.

Variety	Number	Yield bu/a	Heading Date	Plant Height	Test Wt lbs/bu	Lodging %	Lodging Severity
NRN10 x BVR14 2x6 CNT	6722	85.80*	7/ 5	35.25	58.1	25.00	4.25
NRN10 x BVR14 2x6 CNT	676	85.78*	7/ 7	34.25	58.6	42.50	3.50
B52-91 x K338-Lee	6623	85.05*	7/ 3	45.00	59.1	65.00	7.25
NRN10 x BVR14 2x6 CNT	677	83.45*	7/ 7	36.25	56.0	56.25	4.75
Red River 68	12	81.78*	7/ 2	36.50	61.2	61.25	6.00
NRN10 x BVR14 2x6 CNT	6715	80.23*	7/ 8	36.75	58.9	72.50	5.25
NRN10 x BVR14 2x6 CNT	6716	78.88*	7/ 8	35.50	57.6	17.50	2.25
NRN10 x BVR14 2x6 CNT	6714	76.50*	7/ 8	37.00	60.0	26.25	4.00
Fortuna	13596	74.67*	7/ 5	44.00	61.1	87.50	8.25
B52-91 x B60-40	6661	74.10*	7/ 2	46.25	57.3	79.75	7.00
B52-91 x K338-Lee	6620	71.80*	7/ 3	47.25	59.5	66.25	7.75
NRN10 x BVR14 2x6 CNT	6723	71.75*	7/ 8	34.25	57.4	53.75	3.75
B50-18 x RSC 2x B52-91	6679	71.70*	7/ 3	45.50	59.4	81.00	6.50
II-50-17 x PLT 2x B52-91	6610	71.60*	7/ 4	47.25	60.2	70.00	7.00
KF-CNT x B52-91	6632	71.60*	7/ 3	45.50	57.4	71.25	5.00
B52-91 x KF-CNT	6617	71.15*	7/ 3	46.25	59.3	65.00	7.00
3718-6-8 x B52-91	6647	68.77*	7/ 4	46.00	57.9	73.75	7.00
B52-91 x K338-Lee	6621	67.65	7/ 4	48.25	58.5	67.50	6.50
B52-91 x KF-CNT	6619	66.72	7/ 4	45.25	57.7	77.50	8.00
Centana	12974	66.05	7/ 7	48.50	57.7	81.25	7.75
KF-CNT x B52-91	6634	65.40	7/ 2	46.75	58.2	82.50	8.25
NRN10-BVR14 x TC X 498	647	64.25	7/ 3	38.50	57.7	88.75	9.00
Thatcher	10003	63.40	7/ 6	45.25	57.3	70.00	8.00
B52-91 x KF-CNT	6618	63.40	7/ 5	45.50	59.4	70.00	7.75
Wells	13333	63.07	7/ 7	49.00	60.3	73.75	6.75
Leeds	13768	58.19	7/ 5	47.50	60.0	57.50	5.00
Manitou, R.L. 4159	13775	57.57	7/ 5	44.75	58.1	77.50	8.00
Polk	13773	57.22	7/ 6	45.25	59.6	84.75	8.00
Sheridan 1/	13586	54.44	7/ 7	49.50	59.4	80.00	8.50
Chris, 525-1	13751	51.87	7/ 6	46.75	56.9	88.75	8.75

1/ Sheridan is check variety
* Varieties yielding significantly more than the check (.05)

$\bar{x}$..... 70.1
S.E.$\bar{x}$..... 4.8
L.S.D.(.05).. 13.45
C.V.%..... 6.83

Analysis of Variance

Source	D.F.	M.S.	F.
Replications	3	3224.7	35.14*
Varieties	29	355.8	3.88*
Error	87	91.8	
Total	119		

Table 2. Summary of dryland hard red spring wheat yields for the advanced yield nursery grown at the Northwestern Montana Branch Station, Route 4, Kalispell, Montana from 1959 - 1968.

Variety	Number	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	Sta Yrs	% Centana	% Thatcher	% Sheridan
Centana	12974	45.4	33.5	28.3	59.1	34.3	47.8	61.1	50.4	54.5	66.1	10	100	100	96 1/
Thatcher	10003	42.0	29.0	27.4	49.7	34.7	46.7	65.4	62.2	60.6	63.4	10	100	100	98 1/
Sheridan	13586			38.5	59.4	36.9	50.6	72.8	50.9	54.5	54.4	8	104	102	100
Wells	13333				52.6	33.7	57.0	58.4	67.9	62.8	63.1	7	106	103	104
Fortuna	13596						62.9	76.8	66.2	56.4	74.7	5	120	113	119
Manitou R.L. 4159	13776						50.8	62.2	67.5	57.5	57.6	5	95	99	104
Chris 525-1	13751						41.8	59.3	51.3	50.6	51.9	5	91	85	90
(Nrnl0-Bvrl4xTc)x498	647							63.0	50.6	52.7	64.3	4	99	92	99
II-50-17xPlt2xB52-91	6610								72.0	57.8	71.6	3	118	108	126
B52-91xB60-40	6661								71.5	65.3	74.1	3	123	113	132
B52-91 x Kf-Cnt	6619								58.1	56.5	66.7	3	106	97	114
Polk	13773								51.4	52.3	57.2	3	94	86	101
B52-91xK338-Lee	6623									65.8	85.1	2	125	122	139
B52-91xKf-Cnt	6617									62.3	71.2	2	111	108	123
3718-6-8 x B52-91	6647									58.1	68.8	2	105	102	117
Leeds	13768									58.1	58.2	2	96	94	107
B52-91 x K338-Lee	6620									56.8	71.8	2	107	104	118
B52-91 x Kf-Cnt	6618									56.4	63.4	2	99	97	110
KF-Cnt x B52-91	6634									54.1	65.4	2	99	96	110
B52-91 x K338-Lee	6621									57.9	67.7	2	104	101	115
Nrnl0xBvrl4 2x6Cnt	6722										85.8	1	130	135	158
Nrnl0xBvrl4 2x6Cnt	676										85.8	1	130	135	158
Nrnl0xBvrl4 2x6Cnt	677										83.5	1	126	132	154
Red River 68	12										81.8	1	124	129	150
Nrnl0xBvrl4 2x6Cnt	6715										80.2	1	121	127	147
Nrnl0xBvrl4 2x6Cnt	6716										78.9	1	119	124	145
Nrnl0xBvrl4 2x6Cnt	6714										76.5	1	116	121	141
Nrnl0xBvrl4 2x6Cnt	6723										71.8	1	109	113	132
B50-18xRsc2xB52-91	6679										71.7	1	108	113	132
KF-Cnt x B52-91	6632										71.6	1	108	113	132

1/ eight years