TITLE: Winter Wheat

PROJECT: Small Grains Investigations 756

PERSONNEL: Leader - Vern R. Stewart
Cooperator - G. A. Taylor
Cooperating Agencies - Montana Agricultural Experiment Station
Montana Wheat Research and Marketing Committee

OBJECTIVES:

1. To obtain the information necessary for making varietal recommendations and evaluating new varieties and selections.
2. To cooperate in a breeding program in Northwestern Montana designed to produce high yielding varieties with particular emphasis on quality, disease resistance, dwarf smut and stripe rust. Other agronomic characteristics such as straw strength, winter hardiness etc. will be evaluated in this program.

1973 EXPERIMENTS:

1. Western Regional Hard Red Nursery
2. Western Regional White Nursery
3. Intrastate Nursery
4. Elite Stripe Rust Nursery
5. Off Station Nurseries

SUMMARY OF 1973 RESULTS:

Western Regional Hard Red Nursery -

Kalispell - ID70401 was the highest yielding entry in the nursery. Mean for all varieties was 45.6 bu/a. Real differences were found in winter survival of entries. ID33 has a survival reading of 29%, WA5985 and UT80702 had survival readings of 66% and 65% respectively. All other entries exceeded 80%. No dwarf smut was found in this nursery. Table 1.

Stillwater - Stand loss was very high and dwarf bunt infestation low in this nursery due to the extremely low temperatures and no snow cover. No percentage estimates were made on smut. Itana, a very susceptible variety, was smut free in this location. Table 2.

Summary of the data from these two nurseries is found in Table 3. UT755090 is the highest yielding entry, no evidence of dwarf smut, good test weight, fair straw, and somewhat later than Itana, but a little taller.

Western Regional Soft White Nursery:

In 1973 WA5987 and Paha were slightly higher, but not significantly higher, in yield than Nugaines, the check variety, however they are 2 to 3 days later in heading. Three entries were found to be significantly lower in yield. Test weights averaged 60.9 lbs/bu with Nugaines having a test weight of 63.2 lbs/bu, which was the highest in the nursery. WA5987 and Paha had less dwarf smut than Nugaines, however light smut has been found in Paha other seasons. Paha was 5 inches taller than Nugaines in this study. Table 4.

Using Nugaines as a check variety over a ten year period, eight varieties were found to exceed the check. Of these varieties only Luke has satisfactory dwarf smut and stripe rust resistance. Table 5.

Results (con't)

Intrastate Nursery -

The highest yielding entry in this nursery was McCall, however it was not significantly higher than Crest, the check variety. McCall, Wanser and Centurk are usually higher in yield but all 3 are susceptible to dwarf smut in this location. Table 6.

A summary of selected winter wheat varieties grown at the Northwestern Agricultural Research Center 1962-1973 are found in Table 7.

Elite Stripe Rust Nursery -

In this nursery lines from the breeding lines in advance stages are evaluated. Many lines were not harvested this year because of milling quality evaluation received after seeding indicated no need to continue their evaluation. The data obtained from this nursery are recorded in the wheat research committee report.

Off Station -

Three nurseries were seeded in the fall of 1972 in Lake, Sanders, Ravalli and Missoula Counties. The nursery in Missoula county was not harvested because of poor stands and high weed population.

Lake County - Because of the very dry conditions yields were low in this location. Yields were not statistically significant, however Hyslop was the highest yielding entry. Table 8.

Sanders County - Stands and yields were average in this location. McCall is the highest yielding variety in the nursery and is significantly higher in yield than Crest. Table 9.

Table 4. Agronomic data from the western regional white winter wheat nursery grown at the Northwestern Agricultural Research Center at Kalispell in 1973. Field No. E-2

Date Seeded: September 15, 1972 Date Harvested: August 15, 1973
Size of Plot: 16 sq. ft.

C. I. or State No.	Variety	Yield Bu/A	Test Wt. Lbs/Bu.	Heading Date	Plant Height	Dwarf Smut
WA 5987	WA4877//Sel. 66344	74.10	61.00	161.75a	29.50	.00b
CI 14485	Paha	71.07	61.00	160.75a	36.25a	.00b
WA 5988	Gaines//178383/CI 13431	69.27	61.10	160.50a	33.25a	.75b
WA 5986	4877/3/S3//178383/13431	69.12	58.50	163.50a	29.50	.75b
CI 13968	Nugaines 1/	68.47	63.20	158.75	31.00	3.00
ID 725057	ID 5011/WA 4765, Sel.2	67.50	59.80	164.75a	36.75a	1.00b
OR 6734	178383/3*Omar	66.92	62.40	160.25a	43.00a	.00b
WA 5910	181268/Gaines	66.90	62.30	159.00	32.75	.75b
WA 5826	OM/1834-3//178383/13431	66.00	59.10	162.25a	30.50	.50b
OR 6933	Oregon Sel. 896	65.75	61.40	160.50a	38.75a	.75b
CI 13740	Moro	65.57	60.80	160.00a	39.75a	.00b
CI 14586	Luke	65.17	59.10	164.75a	31.25	.00b
WA 5989	N98/WA4765	64.47	60.50	160.00a	31.50	1.00b
ID 71041	Gaines*2/Swedish Type	64.02	62.00	161.00a	38.25a	10.00a
CI 14565	Nord Desprez/2*Sel. 101	63.42	59.10	158.00	30.00	.50b
OR 67205	Cap. Desp./Sel. 101//Drv	63.32	56.40	159.50	26.00b	.75b
CI 14564	Hyslop	63.12	59.70	159.50	29.75	1.00b
CI 14483	Coulee	61.62	60.90	158.50	29.00b	10.00a
OR 65116	Nord Desprez/Sel.101	61.60	57.50	158.50	29.25	.75b
WA 5829	S.Helvia//Suwon92/13645	51.94b	60.50	159.00	29.00b	25.00a
CI 11755	Elgin	50.89b	62.40	160.00a	41.75a	6.25a
CI 1442	Kharkof	45.26b	60.20	159.00	44.00a	30.00a
	$\bar{x}$	63.9	60.9	160.4	33.7	4.2
	F 2/	2.63**	.0	20.82**	68.09**	405.28**
	S.E.$\bar{x}$	4.15	.0	.42	.63	.40
	L.S.D.(.05)	11.72	.0	1.19	1.79	1.14
	C.V.%	6.49	.0	.26	1.88	9.58

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 level
b Values significantly less than the check .05 level

Table 5. Summary of western regional white winter wheat nursery grown at the Northwestern Agricultural Research Center, Kalispell, Montana from 1964-73.

C.I. or State No.	Variety	1964	1966	1967	1968	1969	1970	1971	1972	1973	Sta. Yrs.	$\bar{x}$	% Nugaines
1442	Kharkof	49.2	52.1	47.4	58.5	58.9	56.4	62.1	59.7	45.3	9	54.4	72
11755	Elgin	57.3	52.3	49.6	80.5	51.2	74.1	73.0	70.8	50.9	9	62.2	82
13740	Moro	50.1	85.9	57.2	86.3	65.7	75.4	68.3	68.5	65.6	9	69.2	94
13968	Nugaines		79.7	58.7	85.8	63.2	77.6	102.8	73.0	68.5	8	76.2	100
14485	Paha				98.1	65.4	87.0	101.2	88.9	71.1	6	85.3	114
14564	Hyslop				90.1	62.7	87.3	113.1	90.1	63.1	6	84.4	113
14483	Coulee				84.5	55.4	73.1	100.4	73.8	61.6	6	74.8	100
14586	Luke						93.1	103.1	73.6	65.2	4	83.8	104
14565	Nord Desprez/2*Sel. 101						88.8	111.9	95.8	63.4	4	89.9	112
WA 5826	Omar/1834-3//PI178383/CI13431								69.4	66.0	2	67.7	96
WA 5829	Super Helvia//Suwon 92/CI13645								88.7	51.9	2	70.3	99
OR 6734	PI 178383/3*Omar								78.3	66.9	2	72.6	103
WA 5910	PI 181268/Gaines								85.9	66.9	2	**76.4**	108
ID 71041	Gaines*2/Swedish Type								82.3	64.4	2	73.4	104
WA 5987	Wa4877//Sel. 66344									77.1	1	77.1	113
WA 5988	Gaines//178383/CI 13431									69.3	1	69.3	101
WA 5986	4877/3/S 3//178383/13431									69.1	1	69.1	101
ID725057	ID5011/Wa4765, Sel. 2									67.5	1	67.5	99
OR 6933	Oregon Sel. 896									65.8	1	65.8	96
WA 5989	N98/Wa 4765									64.5	1	64.5	94
OR 67205	Cap. Desp./Sel. 101//Drv									63.3	1	63.3	92
OR 65116	Nord Desprez/ Sel. 101									61.6	1	61.6	90

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