YEAR: 1965

TITLE: Small Grain Investigations (Winter Wheat) 5023

LOCATION: Northwestern Montana Branch Station, Field No. E-1 and several off station locations

DURATION: Indefinite

OBJECTIVES:

1. To obtain the information necessary for making varietal recommendation and for evaluating new varieties and selections.

2. To conduct a breeding program in Northwestern Montana designed to produce high yielding varieties with particular emphasis on acceptable quality and resistance to dwarf bunt and stripe rust. Other agronomic characteristics such as straw strength, winter hardiness, etc, will be evaluated in this program.

3. To determine the effect of seeding date, seeding depth and variety on the incidence of dwarf smut.

EXPERIMENTAL DESIGN AND PROCEDURE:

Standard nursery procedures were used in the variety testing program. In general station studies were four row plots, replicated four times. The design - complete randomized block. Discription of a particular study and the procedures of each will be included in the results and discussion section.

RESULTS AND DISCUSSION:

Intrastate Hard Red

This nursery consisted of eleven commercial varieties and fourteen breeding lines. Nine entries were bulks of P.I. 178383 x Westmont^2. The remaining lines were from material originally supplied by W.S.U. staff.

Delmar was used as the check variety. There were no entries superior in yield to the check.

Stand reduction in this nursery was due primarily to the lack of snow cover during the winter, and "snow mold" in some cases. It was difficult to determine for sure if kill was due to the cold weather or disease.

Dwarf smut was noted on all but two entries, namely; C 63-16 and C 61-9. The percent smut on Delmar was 4% and 10% on Tendoy 61.

Most of the bulk lines of P.I. 178383 x Westmont^2 were somewhat susceptible to dwarf smut and very weak straw. Table 1.

Western Regional Hard Red

There were 29 entries in the western regional hard red winter wheat nursery located in the bunt area, Northwest of Kalispell. High yields were secured from this nursery due in part to the application of 200 pounds of 16-20-0 fertilizer per acre at seeding time and favorable moisture. Lodging was severe on susceptable varieties. Smut was noted on all entries except two.

McCall was the highest yielding entry, but had a 24% smut rating. See table 2.

Western Regional White Wheat

The western regional white wheat nursery contained 19 entries. Winter killing in this nursery was quite severe on all entries. Data showing stand percentage is found in table 3. No yield data was secured because of bird damage during the growing season.

Off station

Growing conditions, results and other information about each nursery will be discussed under the individual county headings. A total of four nurseries were seeded in the fall of 1964. Each nursery consisted of fourteen entries.

Missoula County - There were excellent growing conditions for this test. Yields were above average for the area. Generally stands were good in most varieties. Dwarf smut was most prevalent in Wanalta. C 61-9 was the highest yielding entry. See table 4,for complete data.

Ravalli County - Growing conditions were excellent in the area east of Stevensville where this nursery was grown. Yields are about average for the area. Cheyenne is the lead variety for yield. See table 5.

Lake County - Good fall emergence, but some stand loss in some entries during the winter. C 62-44 is the highest yielding entry, but not significantly better than Westmont which is used as a check. See table 6.

Mineral County - This nursery was "stubbled in". Emergence was fair, but stands were poor at harvest time. Dwarf smut was quite high in susceptible varieties. With the low incidence of smut in Westmont one could conclude that the race present is D-2. See table 7.

Protein determinations were made for all varieties grown off station. The lowest average protein was in Missoula, and the highest in Ravalli County. See table 8.

In all off station locations C 61-9 was the highest yielding entry of the commercial varieties, Westmont and Cheyenne are about equal. See table 9.

A summary of selected varieties grown in Western Montana is found in table 10. For the ten year period Cheyenne is the leading variety in yield. For the last four years, Delmar leads in yield.

In the off station locations C 61-9 was the highest yielding entry.

P. I. 178383 x Westmont^{2} 7-14-5 was the most promising entry in the advance testing of breeding material.

Table 1 . (con't)

Analysis of Variance

Source	D.F.	Mean Square	F.
Replications	3	231.9	3.38
Varieties	24	231.4	3.37
Error	72	68.6	
Total	99		

$\bar{x}$.....	40.5
S.E.$\bar{x}$.....	4.1
L.S.D.(.05)...	11.6
C.V.%.....	10.2

Table 2 . Agronomic data from western regional hard red winter wheat nursery grown on the Lance Claridge farm, Northwest of Kalispell. Four row plots, four replications.

Date seeded: September 15, 1964 Date Harvested: September 1, 1965 Size of Plot: 16 sq. ft.

Variety	C.I.No.	Heading Date	Ht. in Ins.	Replications I	II	III	IV	Total Grams	Yield Bu/A	Bu.Wt. in Lbs.	Stripe Rust Type	Stripe Rust Sever.	Dwarf Smut %	Lodging Type	Lodging Sever.	Lodging Pre.
Burt x Itana, Sel. 125 WC (McCall) BC Bulk #7	13842	6-22	41	615	689	675	824	2803	70.0	56.5	2	20	24	1	.5	8
P.I.178383 x West.		6-19	42	630	665	629	706	2630	65.8	58.2	1	4	9	1	7	99
P.I.178383 x West. BC Bulk #1		6-19	37	565	646	695	689	2595	64.9	56.4	i	0	27	1	7	98
NRN 10-BVR 14 x Burt Sel. 11	13739	6-22	26	647	601	677	665	2590	64.8	53.3	1	5	18	x	x	x
BurtxItana.sel.34	13844	6-21	39	681	565	625	635	2506	62.7	55.6	2	8	22	1	.2	20
Columbia x Utah 175A-53,Sel.275-40-3-1	13839	6-23	42	460	810	681	535	2486	62.2	56.2	2	13	2	1	5	73
P.I.178383 x West BC Bulk #6		6-19	41	564	650	512	736	2462	61.6	55.4	i	0	11	1	9	99
P.I.178383xWest.BC Bulk#2		6-17	41	635	612	640	568	2455	61.4	55.7	i	1	10		9	90
P.I.178383xWest.BC Bulk#3		6-17	40	525	648	594	670	2437	60.9	56.5	i	0	21		7	98
Delmar	13442	6-23	41	615	676	626	506	2423	60.6	56.7	1	1	12	x	x	x
Cheyenne	8885	6-22	44	625	645	594	555	2419	60.5	56.5	1	1	12	1	7	97
P.I.178383xIt.BC Bulk#1		6-21	46	480	805	546	584	2415	60.4	56.5	1	1	21	1	7	99

Table 2 . (con't)

Variety	C.I.No.	Heading Date	Ht. in Ins.	Replications I	II	III	IV	Total Grams	Yield Bu/A	Bu.Wt. in Lbs.	Stripe Rust Type	Stripe Rust Sever.	Dwarf Smut %	Lodging Type	Lodging Sever.	Lodging Prev.
Tendoy	13426	6-23	47	560	646	568	605	2379	59.5	56.8	2	2	24	1	6	97
(Rex-RioxCnn^2)xCnn^3,C62-44		6-24	43	485	590	639	658	2372	59.3	54.8	1	0	0		7	57
(Rex-RioxCnn^2)xCnn^3, 63 M 625	13867	6-18	43	574	631	520	635	2360	59.0	56.5	0	1	14		6	96
Columbia x Utah 175A-53,Sel.275-40-2-2	13840	6-23	40	660	560	560	565	2345	58.6	56.5	3	26	18	1	3	48
HussarxCheyenne^3, 63M525	13866	6-21	45	639	630	505	540	2314	57.9	57.2	1	1	29	1	3	48
Itana Sel. W-1	13846	6-23	43	620	594	690	412	2316	57.9	57.4	2	2	29		6	82
It.xKharkof-17 Sel. 1-26-1	13692	6-21	45	556	619	570	561	2306	57.7	56.9	3	4	18	1	5	62
P.I.178383xIt,BC Bulk#2		6-20	43	515	620	495	650	2280	57.0	57.0	1	2	10	1	9	93
Burt x P.I.178383, Sel. C61-9	13837	6-24	44	631	565	450	591	2237	55.9	54.3	1	0	0		7	87
P.I.178383xWest.BC Bulk#5		6-19	39	550	580	566	502	2198	55.0	55.8	1	0	21	1	7	99
Kharkof	1442	6-21	46	520	650	401	630	2201	55.0	56.0	2	5	17	1	7	96
P.I.178383xWest.BC Bulk#4		6-19	41	514	389	600	610	2113	52.8	56.3	1	0	15	1	8	99
Columbia	12928	6-20	40	544	499	565	480	2088	52.2	56.5	4	100	40		4	86
Rio	10061	6-23	47	492	599	521	477	2089	52.2	56.0	1	1	20		9	99
Colorow	12865	6-21	46	585	515	476	480	2056	51.4	56.9	1	2	25	1	7	82
WasatchxKharkof-17 Sel. 18-5	13691	6-23	48	476	545	471	536	2028	50.7	56.6	2	3	10	1	6	97
Itana	12933	6-21	44	408	535	506	540	1989	49.7*	55.5	4	100	39	1	4	97

NOTE: Delmar is used as a check in this nursery

*: Variety yielding significantly less than the check (.05)

Analysis of Variance

Source	D.F.	Mean Square	F.
Replications	3	13597.69333	2.55
Varieties	28	9548.31000	1.79*
Error	84	5334.87404	
Total	115		

$\bar{x}$..... 58.5
S.E.$\bar{x}$..... 3.65201
L.S.D.(.05).. 10.2
C.V.%..... 6.24

KS
VRS