

TITLE: Small Grain Investigations

PROJECT NUMBER: 5023

PERSONNEL: Leader - Vern R. Stewart

Coordinators -

1. Winter Wheat - E. R. Hehn
2. Spring Wheat - F. H. McNeal
3. Spring Barley - E. A. Hockett and R. F. Eslick
4. Winter Barley - R. F. Eslick
5. Oats - R. F. Eslick

FUNDS: State - \$4415.00

LOCATION: Northwestern Montana Branch Station and off-station locations in several Northwestern Montana counties.

PROBABLE DURATION: Indefinite

EXPERIMENTAL DATA:

INTRODUCTION

The small grain investigations project includes winter wheat, spring wheat, winter barley, spring barley, and oats. The trials are conducted in cooperation with personnel at the Main Station in Bozeman. Plans for work on these projects are formulated and designed in a Planning Conference at the Main Station in Bozeman early in the spring.

Handling of line row and foundation seed is included in the project, however, it is not a research problem.

MATERIALS AND METHODS

Station nurseries are grown in four row plots, ten feet long in general, within a randomized or triple lattice design. Off-station plots were generally grown in a randomized block, single row plots, and four replications. All trials are analyzed using the variance analysis.

Planting was done with the Station's four row belt seeder mounted on a Farmall Cub tractor. Seeding depth depended on moisture and soil conditions, usually one to two inches.

Weeds were controlled when necessary. Cultivation was done with a garden tractor and 2,4-D was applied with a nursery type sprayer on a garden tractor. The irrigated nurseries were irrigated once during the growing season. Two inches of water were applied on June 26, 1961.

Plots were harvested by hand using a small hand scythe. Threshing was done in the field or at the plot immediately following harvest, except oats which were bound and allowed to dry. A portable Vogel threshing machine was used in threshing the plots.

All harvested samples are cleaned and weighed and yields of each plot are calculated from the weights. All weights per plots are given in grams except in larger plots (field size) where pounds per plot are used.

Foundations seeds were harvested with commercial machinery. Line row seed was harvested by hand, that is, in the same manner as the nursery material.

RESULTS AND DISCUSSION

The results and discussion of this project will be considered individually for each crop listed in the introduction.

Winter Wheat

Nurseries grown this year were (1) Western Regional Hard Red Winter, (2) Interstate Hard Red Winter, (3) Dwarf Bunt lines, (4) Short Straw and (5) five off-station nurseries.

Tillage methods for the control of dwarf bunt, production of winter wheat on fallow versus winter wheat on corn land, Westmont versus Wasatch in adjacent plantings, and breeding material from various sources were evaluated and studied. Some 650 rows were planted for observation and study.

The Federal Smut Control Laboratory personnel continued their studies on dwarf bunt in Western Montana.

Western Regional Hard Red Winter

This nursery is grown at many Stations throughout the western region of the United States. The nursery this year was grown on the Lance Claridge farm in an area known to be infected with dwarf bunt (Race D-3). It contained sixteen entries which were grown in four row plots eighteen feet long in four replications. Thirty-two square feet were harvested for yield.

This nursery was seeded September 13, 1960. The soil was very dry at the time of seeding. Seeding depth was shallow to encourage bunt infection. Emergence of this nursery was slow and not until the first of November was there a stand of wheat. Snow cover was light through most of the season. There was no winter killing in the nursery that was evident.

Columbia and Westmont has light bunt infection rate. C.I. 13442 was the only entry found to be bunt free. For the first time in seven years, Westmont was significantly less in yield than other standard entries. This can be accounted for by the high rate of dwarf bunt in Westmont.

Table II gives the results of this study. In studying this table, it shows a high level of bunt in many entries. Yields are about normal for the area.

Table II. Agronomic data from the Western Regional hard red winter wheat nursery at Kalispell, Montana in 1961. Grown on the Lance Claridge farm, four row plots, four replications. Date Planted: September 13, 1960 Date Harvested: July 31, 1961 Size of Plot: 32 square feet

Variety	C. I. Number	Head- ing Date	Dwarf Bunt %	Ht. in.	Grams Per Plot				Total Grams	Yield	
					I	II	III	IV		Bu./ Acre	Bu. Wt.
Columbia	12928	6-14	35.0	25	220	290	230	260	1000	12.5	55.4
Westmont	12930	6-13	30.0	28	285	315	305	275	1180	14.8	55.3
Itana	12933	6-17	27.5	28	305	335	300	245	1185	14.8	57.5
Kharkof	1442	6-15	17.5	30	370	405	355	355	1485	18.6*	58.4
Rio	10061	6-15	35.0	30	345	325	265	280	1215	15.2	56.6
Burt	12696	6-16	15.0	27	445	485	320	340	1590	19.9*	56.5
Wasatch	11925	6-15	5.0	31	415	405	375	330	1525	19.1*	59.5
Tendoy (Cheyenne 57)	13426	6-15	20.0	29	475	480	331	445	1731	21.6*	58.5
Yogo x 112a-520-6-1	13441	6-19	2.5	30	390	360	345	255	1350	16.9	58.3
Brevor x Utah Kanred	13442	6-20	0.0	27	332	350	254	250	1186	14.8	56.9
Rego	13181	6-17	1.5	30	370	350	370	340	1430	17.9*	54.5
Yogo x (Turkey x Oro-221)-117	13542	6-16	10.0	35	350	415	285	305	1355	16.9	56.0
(Yogo x Wasatch-3) x Cheyenne-56-10-1	13633	6-15	5.0	29	326	402	370	330	1428	17.9*	59.0
Cheyenne	8885	6-15	12.5	28	410	385	340	340	1475	18.4*	59.8
(Yogo x Wasatch-3) x Cheyenne-56-6-5		6-15	3.0	29	381	370	368	375	1494	18.7*	59.0
(Yogo x Wasatch-3) x Cheyenne-56-5-3		6-14	9.0	32	400	324	295	315	1334	16.7	58.5

Note: Westmont is the check in this nursery.

* Varieties yielding significantly more than the check (5%)

Mean Yield.....	17.1
S.E.E.8373
L.S.D. (5%).....	2.4
L.S.D. (1%).....	5.6
C.V.	4.87%

Analysis of Variance

Source	D.F.	Mean Square	F
Replications	3	14,847.890	13.24
Varieties	15	8,604.124	7.67
Error	45	1,121.724	
Total	63		