

TITLE: Small Grain Investigations

PROJECT NUMBER: 5023 (Winter Wheat)

PERSONNEL: Leader - Vern R. Stewart
Cooperators - E. R. Hehn, J. A. Hoffmann*, E. L. Kendrick*,
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FUNDS: State - \$ 2956.67

LOCATION: Northwestern Montana Branch Station in field number E R-3, and off-station locations in several Northwestern Montana counties.

PROBABLE DURATION: Indefinite

OBJECTIVES:

1. To obtain the information necessary for making varietal recommendations 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 cultural practices that will return the highest yields per acre and the highest quality wheat.
4. To maintain a pure genetic varietal seed source of recommended winter wheat.

EXPERIMENTAL DATA:

INTRODUCTION

Dwarf bunt and stripe rust are the two major disease problems in winter wheat production in western Montana, and no doubt, the major factor affecting wheat production in this area. Quality, the lack of it, can also be added as one of the major problems.

Variety testing, a breeding program, cultural studies, and a cooperative program with the Regional Smut Control Laboratory in Pullman, Washington combine to make the winter wheat project at the Northwestern Montana Branch Station.

Growing of foundation and certified seed is included in the project report, however, it is not a research problem.

Irrigation versus dryland wheat production study was conducted on the Station this year in a field type study.

MATERIALS AND METHODS

A complete description of procedure and design are found on page seventy of the 1961 Annual Report of the Northwestern Montana Branch Station of technique used in variety testing and seed production.

Four nurseries were seeded in the fall of 1964 on the Station and in the dwarf smut area northwest of Kalispell, Montana. Six offstation nurseries were seeded in the fall of 1964, one each in Missoula, Ravalli, Lake, Sanders, Mineral, and Lincoln Counties. The Intrastate hard red winter wheat nursery contained twenty-five entries and was grown on the Station in field number E-1. The Western Regional Nursery containing thirty entries was seeded on the Howard Braaten farm northwest of Kalispell nine miles in a dwarf smut area. Sixteen entries were placed in the short straw nursery and grown on the Station in field number E-1. The Western Regional white wheat nursery contained nineteen entries and was grown in field number E-1 on the Station. The off-station nurseries grown in single row plots and replicated four times consisted of sixteen entries. The location, grower, and address are found in the tabulated data included later in this report.

The breeding plots were located on the Howard Braaten farm nine miles northwest of Kalispell. 544 rows of bulk, head rows, and plant rows were seeded and observed during the growing season for dwarf bunt, stripe rust, and other agronomic characteristics. Mr. Bruce McCallum grew several selections for winter hardiness at the North Montana Branch Station at Havre.

RESULTS AND DISCUSSIONS

Each nursery as presented above will be discussed separately in this report.

Intrastate Hard Red Winter

Material in this nursery is grown throughout the state of Montana in cooperation with other Agronomists of the Experiment Station system. This nursery was located in field number E-1.

Table XXXIII presents the data from this nursery. Rodco was the lowest yielding entry and had the highest level of dwarf bunt (Tilletia contraversa) infection. Stripe rust (Puccinia striiformis) was not a factor in the nursery this season. The taller variety, generally, lodged considerably more than the shorter strawed varieties. Westmont was used as a check in this nursery and in no case was there any variety significantly higher in yield. Yields were about average for this rotation.

Western Regional Hard Red Winter

This nursery is grown throughout the western states. In 1961 this nursery was seeded on the Howard Braaten farm in an area known to be infected with dwarf bunt (Race D-3). The nursery was located in an area in the field so that there was low areas in the center of the nursery. This caused a poor stand and uneven growth. Because of this no yield data was secured from the study. However, good smut data was obtained from the nursery and are shown in Table XXXIV. Only six entries of the thirty entries had smut readings under fifty percent. California 6097 showed only a trace of smut. Those entries with Wasatch parentage tended to have lower readings, that is, below fifty percent as did Wasatch. Two Utah lines, G.I. 13673 and 13676, were also below fifty percent. Delmar, a variety showing resistance in other areas, had an infection rating of sixty percent.

Table XXXIV. Heading dates and dwarf smut percentage from the Western Regional hard red winter wheat nursery grown on the Howard Branton farm at Kalispell, Montana in 1961-62.
Date Seeded: September 18, 1961

Variety	C. I. No.	Heading Date	Percent Smut
Columbia	12928	6-20	85.0
Westmont	12930	6-20	89.3
Itana	12933	6-22	77.5
Kharkof	1422	6-23	77.5
Rio	10061	6-22	73.8
Burt	12696	6-23	88.5
Wasatch	11925	6-23	48.8
Cheyenne	8885	6-23	76.3
Tendoy	13426	6-23	72.5
Delmar	13442	6-23	60.0
Yogo x Turkey/Oro-117	13542	6-23	92.5
Yogo/Wasatch-3 x Cheyenne-56-10-1	13633	6-22	50.0
Winalta	13670	6-20	90.0
California 6097	13671	6-25	T
231-4-1-13 Utah	13673	6-24	35.0
226-173-11 Utah	13672	6-24	36.3
Pope Alice-Rem-F80 x Cheyenne ²	13676	6-25	68.8
Pope Rem-Rio x Cheyenne ⁵	13675	6-23	87.3
Pope (Rem-Rio x Cheyenne ²) x Turkey ²	13674	6-21	73.8
(Itana #6 x K-17-7-3)-1-26-1		6-23	70.0
(Itana #6 x K-17-7-3)-1-26-2		6-22	75.0
(Itana #6 x K-17-7-3)-1-26-4		6-22	70.0
(Itana #6 x K-17-7-3)-1-26-5		6-22	80.0
(K-17-7-4 x Was.-6)-1-10-5		6-23	26.3
(Was.-2 x K-17-7-2)-1-8-5		6-23	15.0
(Was.-3 x Itana-6)-2-10-5		6-24	50.0
(Yogo x Wasatch-3) x Cheyenne-56-6-5		6-21	45.0
(Yogo x Wasatch-3) x Cheyenne-56-5-3		6-21	50.0
(Yogo x Rescue-21) x Marain-1065		6-22	52.5
Wasatch x (Yogo x Rescue-21)-11		6-21	60.0