CONTRACT BETWEEN
MONTANA AGRICULTURAL EXPERIMENT STATION
RESEARCH CENTERS
and the
MONTANA WHEAT AND BARLEY COMMITTEE

TIME PERIOD: July 1, 1998 to June 30, 1999

TITLE: Evaluation of various materials and practices contributing toward economic crop production under flexible, continuous and other cropping systems in Montana.

PERSONNEL: Research faculty members at/for the following Research Centers:

1. Central Agricultural Research Center - Moccasin
2. Eastern Agricultural Research Center - Sidney
3. Northern Agricultural Research Center - Havre
4. Northwestern Agricultural Research Center - Kalispell
5. Southern Agricultural Research Center - Huntley
6. Western Triangle Agricultural Research Center - Conrad

OBJECTIVES:

1. To evaluate the effects of differing systems on crop and variety performance under diverse environments represented across the Montana Agricultural Experiment Station - Research Center network.

2. To evaluate the potential fit of other materials, concepts and techniques with various cropping systems employed.

BACKGROUND AND JUSTIFICATION:

An ever increasing need is felt among Montana agricultural producers for development and implementation of new and/or refined materials and methods for enhanced economic efficiency in crop production.

PROJECTS:

1. <u>Cropping Systems Investigations</u>:

   a) Evaluation of long-term continuous cropping under no-till and tilled conditions. (Sidney)

   b) Evaluation of spring wheat, durum, barley, and oat varieties under minimum-till, continuous cropping conditions. (Sidney)

   c) Small grain variety performance evaluations under no-till cropping conditions. (Conrad)

   d) Evaluation of winter and spring cereal varieties under a no-till, recrop environment at Moccasin. (Moccasin)

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2. Grain Variety Investigations under Conventional Conditions:

a) Long-term small grain variety performance evaluations under mechanical or chemical fallow conditions off-station in five northern Montana counties. (Havre)

b) Winter and spring wheat variety performance evaluation under northern Montana conditions on the basis of gross production value as influenced by yield, protein, and market. (Havre)

c) Off-station winter wheat variety evaluations in two counties of the Western Triangle area. (Conrad)

d) Off-station spring wheat variety evaluations in three counties of the Western Triangle area. (Conrad)

e) Off-station barley variety evaluations in three counties of the Western Triangle area. (Conrad)

f) Off-station evaluation of winter wheat variety performance near Denton, Fort Benton, Moore, and Winifred. (Moccasin)

g) Off-station evaluation of spring wheat variety performance near Denton, Fort Benton, and Winifred. (Moccasin)

h) Off-station evaluation of spring barley variety performance near Denton and Fort Benton. (Moccasin)

i) Evaluation of spring durum varieties at CARC and near Denton, Fort Benton, and Winifred. (Moccasin)

j) Off-station evaluation of winter wheat variety performance near Broadview. (Huntley)

k) Off-station evaluation of spring wheat and barley variety performance near Broadview/Molt. (Huntley)

l) Evaluation of spring wheat and durum variety performance in dryland and irrigated off-station trials in six eastern Montana counties. (Sidney)

m) Regional spring wheat, durum, and oat evaluations. (Sidney)

n) Evaluation of irrigated and dryland durum, soft white and hard red spring wheat quality in eastern Montana. (Sidney)

o) Soft white winter wheat evaluation. (Kalispell)

3. Oilseed, Pulse and Miscellaneous Crop Investigations:

a) Dryland evaluation of standard and specialty oil safflower varieties. (Havre)

b) Dryland recrop evaluation of safflower varieties. (Moccasin)

c) Evaluation of winter, covered wheat and triticale breeding lines and varieties at CARC. (Moccasin)

d) Evaluation of spring, covered wheats and triticale breeding lines and varieties at CARC. (Moccasin)

e) Evaluation of winter, covered wheats and triticale breeding lines and varieties at SARC. (Huntley)

f) Evaluation of spring, covered wheats and triticale breeding lines and varieties at SARC. (Huntley)

4. Crop Fertility Investigations:

a) Comparison of spring wheat and barley varietal response under conditions of low versus optimum fertility off-station at Turner. (Havre)

b) Effects of nitrogen and phosphorus on durum. (Conrad)

5. Disease Management Investigations:

a) Evaluation of Advanced Yield Winter Wheat lines for disease resistance. (Kalispell)

b) Evaluation of Preliminary Hard White Spring Wheat lines for disease resistance. (Kalispell)

c) Evaluation of Early Yield Barley lines for disease resistance. (Kalispell)

d) Early generation winter wheat screening TCK. (Kalispell)

6. Weed Management Investigations:

a) Herbicide resistant winter wheat tolerance study. (Kalispell)

b) Downy brome control with AC299,263 and herbicide resistant winter wheat. (Kalispell)

7. Uniform Statewide Variety Testing of Small Grains:

a) Intrastate Winter Wheat Variety Nursery

b) Advanced Yield Spring Wheat Variety Nursery

c) Intrastate Spring Barley Variety Nursery

d) Uniform Montana Oat Variety Nursery

Trials to be conducted on dryland and/or under irrigation at Conrad, Havre, Huntley, Kalispell, Moccasin, and Sidney in cooperation with MAES Breeder/Geneticists in Bozeman.

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PROCEDURES:

Scientific research procedures will be employed appropriate to each specific project listed herein.

APPLICATION AND RESULTS:

Results substantiated via consistency with adequate repetition are available for dissemination to the Montana crop producer as well as the scientific community.

CURRENT or PENDING BUDGETARY SUPPORT:

All projects included herein are partially supported by MAES funding.

POTENTIAL FOR ENHANCED EXTRAMURAL FUNDING:

Much of the research conducted within this overall project is associated with the development of crop performance databases over substantial periods of time and numerous environments. While it is difficult to obtain most types of extramural funding for such work, the results arising from long-term investigations serve well in documenting base data for proposals toward other grant-supported research endeavors.

INCREASED COMPETITIVENESS DUE TO THIS FUNDING:

Much of the research associated with this project is conducted off-station on cooperating producer's farms. The addition of important cropping environments differing from those represented by the fixed-location research facilities is additive to overall databases employed to support producer decisions in cropping systems, crop and variety selection, crop nutrition, and crop pest management.

BUDGET: **MWBC = partial project funding**

Research Center	Uniform Statewide Variety Testing	Other Projects	Center Total
Central at Moccasin	$ 1,000	$ 11,000	$12,000
Eastern at Sidney	1,000	11,000	12,000
Northern at Havre	1,000	11,000	12,000
Northwestern at Kalispell	1,000	11,000	12,000
Southern at Huntley	1,000	11,000	12,000
Western Triangle at Conrad	1,000	11,000	12,000
Totals	$ 6,000	$66,000	$72,000

NOTE:

An additional $5,000 per Research Center was awarded at the 1998 MWBC Budget Meeting bringing the FY98-99 total for each Center to $17,000 and the grand total for Research Centers to $102,000.