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

TIME PERIOD: July 1, 1999 to June 30, 2000

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)

2. <u>Grain Variety Investigations under Conventional Conditions</u>:

   a) Long-term small grain variety performance evaluations under mechanical or chemical fallow conditions off-station in three 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 the Central Triangle area. (Conrad)

d) Off-station spring wheat variety evaluations in four Triangle area counties. (Conrad)

e) Off-station barley variety evaluations in four Triangle area counties. (Conrad)

f) Evaluation of winter wheat variety performance in off-station trials near Denton, Fort Benton, Moore and Winifred. (Moccasin)

g) Evaluation of spring wheat variety performance in off-station trials near Denton, Fort Benton and Winifred. (Moccasin)

h) Evaluation of spring barley variety performance in off-station trials near Denton and Fort Benton. (Moccasin)

i) Evaluation of durum variety performance in off-station trials near Moccasin, Denton, Fort Benton and Winifred. (Moccasin)

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

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

l) Off-station evaluation of durum wheat variety performance near Molt. (Huntley)

m) Evaluation of spring wheat variety performance under irrigated and dryland conditions in six eastern Montana counties. (Sidney)

n) Evaluation of durum variety performance under irrigated and dryland conditions in six eastern Montana counties. (Sidney)

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

p) Evaluation of spring wheat variety performance in off-station trials in Lake County. (Kalispell)

q) Evaluation of spring barley variety performance in off-station trials in Lake County. (Kalispell)

3. <u>Oilseed, Pulse and Miscellaneous Rotation Crop Investigations</u>:

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

b) Evaluation of oilseed crop species/varieties on dryland recrop in central Montana. (Moccasin)

c) Evaluation of winter triticale lines for grain yield and adaptation to dryland cropping in central Montana. (Moccasin)

d) Dryland pea, lentil and chickpea variety evaluations. (Huntley)

e) Irrigated chickpea and short season soybean evaluations. (Huntley)

f) Dryland Interstate Winter Canola Yield Trial. (Huntley)

4. Crop Fertility Investigations:

   a) Seeding rate and nitrogen rate effects on durum quality. (Conrad)

5. Disease Management Investigations:

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

   b) Evaluation of Soft White Winter Wheat Nursery lines for disease resistance. (Kalispell)

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

   d) Evaluation of Intrastate Barley Nursery lines for disease resistance. (Kalispell)

   e) Early generation winter wheat screening for TCK. (Kalispell)

6. Insect Management Investigations:

   a) Evaluation of wheat stem sawfly resistant winter wheat lines near Molt. (Huntley)

   b) USDA-APHIS Cereal Leaf Beetle Biocontrol Insectary. (Huntley)

   c) Evaluation of seed treatment insecticides for control of Cereal Leaf Beetle on spring barley. (Huntley)

   d) Evaluation of post-emergence foliar insecticides for control of Cereal Leaf Beetle on spring barley. (Huntley)

7. Weed Management Investigations:

   a) Wild oat management investigations. (Kalispell)

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

8. Other Agronomic Investigations:

   a) Winter wheat forage yield evaluations. (Huntley)

   b) Winter survival of winter-annual pea and lentil selections compared to winter wheat and winter barley survival. (Huntley)

9. 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.

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