

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

TIME PERIOD: July 1, 2001 to June 30, 2002

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 the following Research Centers:

1. Central Agricultural Research Center (CARC) – Moccasin
2. Eastern Agricultural Research Center (EARC) – Sidney
3. Northern Agricultural Research Center (NARC) – Havre
4. Northwestern Agricultural Research Center (NWARC) – Kalispell
5. Southern Agricultural Research Center (SARC) – Huntley
6. Western Triangle Agricultural Research Center (WTARC) – 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. Cereal Variety Investigations under No-Till, Min-Till and Continuous Cropping Conditions:
 - a. Evaluation of continuous spring wheat cropping systems. (EARC)
 - b. Evaluation of spring wheat, durum, barley, and oat varieties under minimum-till, continuous cropping conditions. (EARC)
 - c. Small grain variety performance evaluations under no-till cropping conditions. (WTARC)
 - d. Evaluation of spring and winter cereal grain varieties under a no-till, recrop environment. (CARC)
2. Cereal Variety Investigations under Conventional Conditions:
 - a. Long-term small grain variety performance evaluations under mechanical or chemical fallow conditions off-station in northern Montana counties. (NARC)

- b. Long-term 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. (NARC)
 - c. Off-station winter wheat variety evaluations in the central Triangle area. (WTARC)
 - d. Off-station spring wheat variety evaluations in four Triangle-area counties. (WTARC)
 - e. Off-station barley variety evaluations in four Triangle-area counties. (WTARC)
 - f. Evaluation of winter wheat variety performance in off-station trials near Denton, Fort Benton, Moore and Winifred. (CARC)
 - g. Evaluation of spring wheat variety performance in off-station trials near Denton, Fort Benton, and Winifred. (CARC)
 - h. Evaluation of spring barley variety performance in off-station trials near Denton and Fort Benton. (CARC)
 - i. Dryland and irrigated hard red and hard white winter wheat performance trials near Broadview, Forsyth, Huntley, Indian Creek and Lodgegrass. (SARC)
 - j. Dryland and irrigated spring wheat performance trials near Bridger, Hysham, Molt and Ryegate. (SARC)
 - k. Dryland and irrigated durum performance trials near Bridger, Hysham, Molt and Ryegate. (SARC)
 - l. Dryland and irrigated spring barley performance trials near Bridger, Hysham, Molt and Ryegate. (SARC)
 - m. Dryland soft white winter wheat performance trial near Huntley. (SARC)
 - n. Soft white winter wheat evaluation. (NWARC)
 - o. Off-station spring wheat variety evaluations in eastern Montana. (EARC)
 - p. Off-station durum variety evaluations in eastern Montana. (EARC)
 - q. Uniform regional spring wheat, durum, and oat variety evaluations. (EARC)
3. Oilseed, Pulse and Miscellaneous Rotation Crop Investigations:
- a. Evaluation of winter pea and winter lentil lines for adaptation including winter survival, seed yield and production foliage for green manure. (CARC)
 - b. Evaluation of winter triticale lines for grain yield and adaptation to dryland cropping in Montana. (SARC)
4. Crop Fertility Investigations:
- a. Seeding rate and nitrogen rate effects on durum quality. (WTARC)

5. Disease Management Investigations:
 - a. Early generation winter wheat screening for TCK. (NWARC)
 - b. Evaluation of advanced winter wheat lines for disease resistance. (NWARC)
 - c. Evaluation of spring wheat lines for disease resistance. (NWARC)
 - d. Evaluation of barley lines for disease resistance. (NWARC)
6. Weed Management Investigations:
 - a. Wild oat control in spring wheat with reduced herbicide rates. (NWARC)
 - b. Wild oat herbicide screening evaluations in spring wheat. (NWARC)
7. Other Agronomic Investigations:
 - a. Evaluation of seed boot and furrow opener configurations for optimizing seed and fertilizer placement with air drills under differing cropping systems. (NARC)
8. Uniform Statewide Small Grain Variety Investigations:
 - a) Intrastate Winter Wheat Variety Evaluation
 - b) Advanced Yield Spring Wheat Variety Evaluation
 - c) Intrastate Spring Barley Variety Evaluation
 - d) Uniform Montana Oat Variety Evaluation

Trials to be conducted on dryland and/or under irrigation at Bozeman, Conrad, Havre, Huntley, Kalispell, Moccasin and Sidney under the leadership of, and in cooperation with, MAES Breeder/Geneticists and their Research Associates 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 to 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	Off-Station Trials & 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