

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

TITLE: Assessing agronomic practices to advance cereal production in Montana

TIME PERIOD: Jan 1, 2017 to Dec 31, 2017

PERSONNEL: Research scientists at the following AES Research Centers:

1. Southern Agricultural Research Center (SARC) - Huntley
Kent A. McVay, Extension Crop Scientist & Coordinator
2. Northern Agricultural Research Center (NARC) - Havre
Peggy Lamb Crop Scientist
3. Central Agricultural Research Center (CARC) - Moccasin
Pat Carr, Superintendent/Crop Scientist
4. Eastern Agricultural Research Center (EARC) - Sidney
Chengci Chen, Superintendent/Crop Scientist
5. Northwestern Agricultural Research Center (NWARC) - Kalispell
Robert N. Stougaard, Superintendent/Weed Scientist
6. Western Triangle Ag Research Center (WTARC) - Conrad
Gadi V.P. Reddy, Superintendent/Entomologist

COOPERATORS: Research Associates, Assistants, Technicians and Farm Managers at each research center, and cooperating producers hosting off-station research trials on farms across Montana.

OBJECTIVES:

1. To evaluate the effects of differing systems on crop and variety performance under diverse environments represented across the state of Montana.
2. To evaluate the potential fit of other materials, concepts and techniques with various cropping systems employed for cereal crop production.

BACKGROUND AND JUSTIFICATION:

Montana agricultural producers are always looking for the development and implementation of new and/or refined materials and methods for enhanced economic efficiency in cereal crop production. This project is designed to provide answers on these issues to producers across the many regions of the state.

PROJECTS:

- I. Cropping System Investigations
 - a. Spring barley performance following various cover crop mixes in southcentral Montana – SARC
 - b. Winter wheat and barley yield following dual-use crops grown for cover and forage in central Montana – CARC
 - c. Evaluation of spring wheat under dryland recrop conditions – EARC
 - d. Evaluation of durum under dryland recrop conditions – EARC
 - e. Evaluation of barley under dryland recrop conditions – EARC
 - f. Evaluation of continuous spring wheat under minimum-till, no-till, and crop/fallow cropping systems – EARC
 - g. Evaluation of a spring wheat, safflower, chickpea rotation under chemical and chemical-free production – EARC
- II. Cereal Variety Performance Evaluations
 - a. Hard Red & White Winter Wheat Trials
 - i. Off-station winter wheat variety performance trials in south central Montana – SARC
 - ii. North central Montana off-station winter wheat cultivar performance evaluations – NARC
 - iii. Off-station winter wheat cultivar evaluations for the Western Golden Triangle area of Montana – WTARC
 - iv. Winter cereal forage cultivar evaluations for the Western Golden Triangle area of Montana – WTARC
 - v. Adaptation of winter wheat cultivars to growing conditions in central Montana – CARC
 - vi. Evaluation of Clearfield Winter Wheat Experimental Lines–NWARC
 - b. Hard Red & White Spring Wheat Trials
 - i. Off-station spring wheat variety performance trials in south central Montana – SARC
 - ii. North central Montana off-station spring wheat cultivar performance evaluations – NARC
 - iii. Off-station spring wheat cultivar evaluations for the Western Golden Triangle area of Montana – WTARC
 - iv. Adaptation of spring wheat cultivars to growing conditions in central Montana – CARC
 - v. Western Regional Hard Spring Wheat Nursery – NWARC
 - vi. Spring Wheat off station nursery – NWARC
 - vii. Evaluation of spring wheat varieties under dryland fallow and dryland recrop conditions at four off-station sites. – EARC
 - c. Soft White Wheat Trials
 - i. Western Regional Soft Spring Wheat Nursery – NWARC
 - ii. Western Regional Soft White Winter Wheat Nursery – NWARC

- d. Durum Trials (none this year funded by this project)
 - i. North central Montana off-station spring durum cultivar performance evaluations – NARC.
 - ii. Durum cultivar evaluations for the Western Golden Triangle area of Montana - WTARC
 - iii. Evaluation of durum varieties under dryland fallow and dryland recrop conditions at four off-station sites. – EARC
- e. Spring Barley Trials
 - i. Off-station spring barley variety performance trials in south central Montana – SARC
 - ii. Off-station spring barley cultivar evaluations for the Western Golden Triangle area of Montana – WTARC
 - iii. Adaptation of spring barley cultivars to growing conditions in central Montana – CARC
 - iv. Evaluation of Hull-less Barley Varieties -- NWARC
- III. Alternative Crop Management (none this year)
- IV. Crop Nutrient Management (none this year)
- V. Disease Management (none this year)
- VI. Insect Management (none this year)
- VII. Weed Management (none this year)
- VIII. Other studies (none this year)

PROCEDURES:

All projects are replicated either three or four times in randomized designs appropriate to each project. All reported grain yields and protein are corrected to a uniform moisture level as reported in the results table for each project. Grain moisture and test weight are typically measured using Dickey-John moisture meters. Grain protein is determined using either Perten or Foss NIR technology.

APPLICATION AND RESULTS:

Results are available to the Montana crop producer as well as to the scientific community. All results from these investigations will be available in CD format by request and can be found on the web at the Southern Agricultural Research Center website (<http://www.sarc.montana.edu/>) as well as at the Montana Wheat and Barley Committee website (<http://wbc.agr.mt.gov/>).

CURRENT or PENDING BUDGETARY SUPPORT:

All projects included herein are partially supported by MAES funding to include scientist salaries. Projects included herein are not supported by other grants.

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.

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 the overall databases employed to support producer decisions in cropping systems, crop and variety selection, crop nutrition, crop pest management and general agronomics.

NUMBER OF YEARS MWBC HAS FUNDED THIS PROJECT:

This Joint Research Center project has been funded by MWBC for 45 years (1972-2016) starting with a total award of \$14,000 in 1972.

OVERALL BUDGET:

Category	Amount
Salary	\$124,997
Benefits	42,395
Supplies/Expendables	18,820
Travel	8,620
Contracted Services	3,500
Repair/Maintenance	11,568
Communication	100
Grand Total	\$210,000

Budget justification. This budget is a cumulative summary of six research centers including Eastern, Northern, Western Triangle, Northwestern, Central, and Southern Agricultural Research Center. Expenses are estimated for the period Jan 1, 2017 through Dec 31, 2017. The majority of this budget is for personnel including summer help and research associate salaries and benefits. There is approximately \$19,000 included for supplies and expendables to cover the costs of fertilizer, herbicides, bags, etc. Another \$12,000 is included for repair and maintenance of equipment. Travel accounts for \$8,600. The remainder is split between contracted services for sample analysis and communication costs. Individual station budgets can be obtained from OSP upon request.