

Funded Research Projects for FY 06

Title: Evaluation of various materials and practices contributing toward economic crop production under flexible, continuous and other cropping systems in Montana
Institution: MSU Research Centers
Amount Funded: \$90,000

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.

Title: Winter Wheat Breeding/Genetics
Personnel: Phil Bruckner
Amount Funded: \$70,000

Objectives:

- 1) Develop improved cultivars of winter wheat adapted to Montana climatic conditions and cropping systems, which possess superior on-farm production characteristics (grain yield, winter hardiness, adequate and durable pest resistance, stress tolerance, agronomic characteristics) and superior end-use quality characteristics.
- 2) Isolate, as much as possible, our foreign wheat customers from variations in wheat quality performance by development and release of suitable cultivars and production research to develop strategies to maximize quality consistency for wheat produced in Montana.
- 3) Investigate environmental, genetic, and management factors which influence wheat productivity and end-use in Montana including 2005 projects: selection methods to combine low polyphenol oxidase (PPO) and high grain protein in wheat.
- 4) Coordinate Montana statewide winter wheat variety testing program and provide long-term performance data necessary for cultivar release decisions, variety recommendations and producer management decisions.

Title: Spring Wheat Breeding and Genetics
Personnel: Luther Talbert and Susan Lanning
Amount Funded: \$70,000

Objectives:

- 1) Develop spring wheat varieties for Montana producers.
- 2) Manage the statewide variety testing program for Montana.
- 3) Conduct research in wheat genetics to assist the breeding program.

Title: Developing Improved Barley Varieties for Montana Farmers
Personnel: Tom Blake, Professor, Plant Sciences and Plant Pathology
Patrick Hensleigh, Research Associate
Amount Funded: \$60,000

Objectives:

- 1) Develop, release and have adopted improved malt barley varieties.
- 2) Improve our understanding of the genetic bases of variation for quality and adaptation.
- 3) Lay the groundwork for improved drought tolerance in Montana adapted germplasm.

Title: Improved Quality of Montana Hard Red and Hard White Wheats
Personnel: Deanna Nash
Amount Funded: \$30,000

Objectives:

- 1) To evaluate end-use quality of hard red and hard white wheat lines developed by MSU spring and winter wheat breeding programs.
- 2) Expand whole wheat ash testing to include the preliminary and advanced spring wheat lines and add PPO testing and dough extensibility testing to the quality evaluation tests.
- 3) Showcase Montana's newest varietal releases by baking bread and making noodles for visiting trade teams to sample while they tour the Cereal Quality Lab (CQL) testing facilities.
- 4) Participate in the milling and baking contests by processing and judging entries submitted for the Central Montana Fair and the Chouteau County Fair.
- 5) Conduct tours and hands-on demonstrations through the Cereal Quality Lab to interested students, faculty and legislators about what we do to promote Montana wheat quality.
- 6) To participate in research projects designed to determine ways to improve end-use quality parameters of new wheat varieties by cooperating with Montana Agricultural Experiment Station researchers and producers as well as cooperating with the general public and industry to improve cereal quality.

Title: Breeding Between Market Classes of Wheat
Personnel: Jamie D. Sherman
Amount funded: \$34,000

Objectives:

- 1) Use recently developed molecular markers to inter-convert current spring and winter wheat varieties.
- 2) Develop the tools to allow inter-conversion of red and white-seeded wheat breeding germplasm.

Title: Variety Protection Fund and International Markets
Personnel: Jeff Jacobsen, Dean and Director
Amount funded: \$24,215

Objectives:

- 1) Provide start up funds in support of the new MSU Variety Release Policy for wheat and barley that encourage PVP title V designation.
- 2) Reimburse international spring wheat market trip expenses.

Title: Reducing the Impact of Fusarium Crown Rot on Montana Wheat
Personnel: Alan T. Dyer, Robert Johnston and Andrew Hogg
Amount funded: \$20,000

Objectives:

- 1) Establish a *Fusarium* crown rot (FCR) nursery at the Huntley Research Center for evaluation of FCR control measures including cultivar resistance, seed treatments and cultural practices under dryland (low rainfall) conditions.
- 2) Evaluate wheat cultivars widely grown in Montana for disease resistance.
- 3) Determine the consequences that adjustments in seeding densities and available nitrogen have on yield, grain quality and FCR severity.

Title: Dough Extensibility Test for Improved Quality of Montana Hard Red and Hard White Wheat
Personnel: Deanna Nash
Amount funded: \$16,020

Objective:

- 1) To add dough extensibility testing to the end-use quality evaluation of wheat lines developed by the MSU wheat breeding programs.

Title: Herbicide Injury Potential to Montana Wheat Varieties
Personnel: Bob Stougaard, Northwestern Agricultural Research Center, Kalispell
Amount Funded: \$12,210

Objectives:

- 1) Determine if wheat varieties differ in tolerance to recently developed herbicides, and assess herbicide effects on stem path development.

Title: Sustainable Crop and Pest Management
Personnel: Gregg R. Carlson and Peggy F. Lamb, Northern Agricultural Research Center
Amount Funded: \$10,000

Objectives:

- 1) To assist in the continuance and maintenance of sustainable crop and pest management rotation studies in place in northern Hill County as USDA funding support comes to a close and potential future funding is secured to continue crop rotation investigations on the existing database.
- 2) To survey the soil health and crop pest effects of 90 years of continuous dryland cropping versus fallow alternated cropping systems with winter wheat, spring wheat and corn at Havre.

Title: Weed-Resistant Small Grain Varieties for Montana
Personnel: Bob Stougaard
Amount funded: \$10,000

Objective:

- 1) Identify and breed for novel small grain plant traits contributing to improved weed suppression, stress resistance and end-use quality.

Title: Early generation durum selection and germplasm improvement
Personnel: Joyce Eckhoff, MSU Eastern Agricultural Research Center
Amount Funded: \$10,000

Objectives:

- 1) To produce improved durum germplasm for development of varieties for Montanan producers.
- 2) To develop value-added characteristics in durum for manufacture of specialty products.

Title: Sustainable Pest Management Field Survey
Personnel: David M. Wichman, Central Agricultural Research Center
Amount funded: \$10,000

Objectives:

- 1) To survey the insect, disease and weed pests in fields where no-till and crop species rotations have been implemented for ten or more years.
- 2) To determine the effects of utilizing no-till and crop rotation practices on soil organic matter.

Title: Comparing low and high input strategies in diversified cropping systems.
Personnel: Perry Miller and Jeff Holmes
Amount Funded: \$9,240

Objectives:

- 1) Compare diversified no-till and organic cropping systems for crop productivity, quality and resource use efficiency.
- 2) Compare low and high input strategies for crop productivity, quality and resource use efficiency.

Title: Wild Oat Control with Silverado and Osprey in Malt Barley.
Personnel: Steve King, Southern Agricultural Research Center, Huntley
Amount Funded: \$8,000

Objectives:

- 1) Evaluate the control of wild oats in malt barley with the herbicides Silverado and Osprey.
- 2) To determine the tolerance of malt barley to applications of the two herbicides applied alone or in combination with various small grain herbicides.

Title: Weed seed bank composition and dynamics in small grain fields
Personnel: Fabian Menalled, Kristin Harbuck and Lisa Rew
Amount Funded: \$7,307

Objectives:

- 1) Assess weed seed bank composition in representative small grain fields of Montana.
- 2) Quantify seed bank dynamics in a spring wheat fallow system with varying density burial depth, seeding density and row spacing.
- 3) Generate a computer simulation model to analyze the importance of environmental and management variables in seed bank dynamics.

Title: Are Free Trade Agreements Fairly Implemented: NAFTA and other Wheat and Barley Trade Issues, Trade Policies, Trade Disputes, and Trade Negotiations
Personnel: Vincent H. Smith
Amount funded: \$5,000

Objectives:

- 1) To assess the extent to which the North American Free Trade Association (NAFTA) has created genuine free trade in wheat and barley between the U.S. and its NAFTA trading partners – Canada and Mexico.
- 2) To identify areas in which free trade has not been fully established under NAFTA provisions (for example, the Canadian Wheat Board exports of Durum and Hard Red Spring wheat into local U.S. markets) and to assess the efficacy of NAFTA trade dispute resolution procedures and U.S. trade laws in resolving issues of unfair trading practices.
- 3) To examine potential trade policy solutions to NAFTA wheat and barley trade issues, both in the context of revisions to NAFTA and the ongoing World Trade Organization (WTO) negotiations.
- 4) To provide an outreach education program to Montana agricultural commodity groups, Montana decision makers and Montana's congressional delegation, based on the findings of this research.

Title: Continuing as an Underwriter for "Montana Ag Live!"
Personnel: Jack Rieseeman, Extension Plant Pathologist and Executive Producer
Amount Funded: \$2,500

Objectives:

- 1) A call-in television program designed to address, in a timely and cost-effective manner, the needs of agricultural producers in Montana.
- 2) Place special emphasis on production crops.

Title: Ag Appreciation Weekend 2005
Personnel: Dr. Jeff Jacobsen, Dean and Director
Amount Funded: \$1,000

Objectives:

- 1) Provide students in the College of Agriculture at MSU the opportunity to participate and represent MSU at regional and national contests, conferences and other important events by raising funds during MSU's Ag Appreciation Weekend, November 2006, through corporate sponsorships and donations.
- 2) Showcase agriculture in Montana during Ag Appreciation Weekend.

Title: Monitoring of Established, Redistributed Wheat Stem Sawfly Parasitoids
Personnel: David Weaver
Amount Funded: \$1,000

Objectives:

- 1) To continue a pilot program that is monitoring the population growth inoculatively established sawfly parasitoids on farms where historically there was sawfly damage in the presence of negligible parasitism. This project is conducted in direct collaboration with selected wheat producers and wheat grower organizations and aims to evaluate the continuing success of these parasitoids. Establish two new sites in eastern Montana to maximize sampling efficiency in that area.