

Funded Research Projects for FY 04

Title: Support for Six Research Centers

Institution: MSU

Department: Montana Agricultural Experiment Stations

Amount Funded: \$72,000

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: Spring Wheat Breeding and Genetics

Institution: MSU

Department: MSU/Plant Sciences and Plant Pathology

Principal Investigator: Luther Talbert

Amount Funded: \$70,000

Objectives:

- 1) Develop spring wheat varieties for Montana producers.
- 2) Provide variety performance data to producers.
- 3) Conduct experiments designed to improve the productivity of the spring wheat breeding project.

Title: Winter Wheat Breeding and Genetics

Institution: MSU

Department: MSU/Plant Sciences and Plant Pathology

Principal Investigator: 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 2003 project: selection methods for low polyphenol oxidase (PPO) levels and yield expectation and agronomic considerations for reseeding winterkilled winter 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: Developing and Releasing Improved Barley Varieties for Montana Producers

Institution: MSU

Department: MSU/Plant Sciences and Plant Pathology

Principal Investigator: Pat Hensleigh

Amount Funded: \$60,000

Objective:

The main objective of this project is to develop barley varieties that improve the economic value of barley for Montana producers. This will be achieved through the use of improved germplasm for initial crosses, selection and advancement of the lines exhibiting the greatest potential, a thorough line evaluation system throughout the state of Montana, and finally release and recommendation of improved lines. Specifically, our focus will be on improving yield and agronomic performance of lines with improved malting quality, as well as feed barleys. Additionally, we will begin studies to improve the yield of hulless waxy barley and determine if it has potential for production in Montana.

Title: Improved Quality of Montana Hard Red and Hard White Wheats

Institution: MSU

Department: MSU/Plant Sciences and Plant Pathology

Principal Investigator: Deanna Nash

Amount Funded: \$25,000

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) Host visiting Trade Teams to showcase Montana's newest varietal releases.
- 3) Participate in county fair milling and baking contests around the state.
- 4) Conduct tours and hands-on demonstrations through the Cereal Quality Lab to educate students, faculty, and legislators about what we do to promote Montana wheat quality.
- 5) To determine end-use quality parameters of genetically altered wheat to contribute to the understanding of wheat genetics and help geneticists determine the best genes for superior milling and baking quality.
- 6) To cooperate with Research Centers, researchers, producers, general public and industry to educate and explore areas to improve cereal quality.

Title: Weed-Resistant Wheat Varieties for Montana

Institution: MSU

Department: MSU/Northwestern Agricultural Research Center

Principal Investigator: Bob Stougaard

Amount Funded: \$20,779

Objective:

Identify and breed for novel spring wheat plant traits contributing to improved competitiveness against weeds, vigor and end-use quality.

Title: *Fusarium* Crown Rot and Wheat Stem Sawfly Infestation of Diverse Wheat, Durum and Barley Lines

Institution: MSU

Department: MSU/Department of Entomology

Principal Investigator: Andrew Lenssen

Amount Funded: \$14,265

Objectives:

- 1) Evaluation of *Fusarium* Crown Rot on lines and cultivars of spring wheat, durum and barley.
- 2) Identification of *Fusaria* species, casual agent of crown rot on spring wheat, durum and barley.
- 3) Compare infestation and survival of wheat stem sawfly in diverse spring wheat, durum and barley lines.
- 4) Compare yield and quality of diverse spring wheat, durum and barley lines.

Title: Enhanced Field Selection for Wheat Stem Sawfly Resistance

Institution: MSU

Department: MSU/Plant Sciences and Plant Pathology

Principal Investigator: Phil Bruckner

Amount Funded: \$12,000

Objectives:

- 1) Subject early-generation segregating winter wheat bulk populations and derived lines to heavy selection pressure for Wheat Stem Sawfly (WSS) resistance and select plant phenotypes resistant to WSS infestation and cutting damage.
- 2) Evaluate spring and winter wheat cultivars and advanced lines for resistance to infestation and cutting damage by WSS and for yield performance under heavy infestation by WSS.
- 3) Systematically evaluate selected germplasm for enhanced stem solidness and alternative sources of WSS resistance.
- 4) Provide field sites, representative of sawfly-infested production regions, for research and demonstration to producers of effective sawfly management strategies, including use of resistant cultivars.

Title: Development of Winter Wheat Germplasm With Different Levels of Polyphenol Oxidase and Grain Protein

Institution: MSU

Department: MSU/Plant Sciences and Plant Pathology

Principal Investigator: John Martin

Amount Funded: \$10,000

Objectives:

- 1) Assess the variability for grain protein and polyphenol oxidase (PPO) in segregating populations of winter wheat.
- 2) Identify high and low protein genotypes that are high in polyphenol oxidase and high and low protein genotypes that are low in polyphenol oxidase.

Title: Early Generation Durum Selection and Germplasm Improvement

Institution: MSU

Department: MSU/Eastern Agricultural Research Center

Principal Investigator: Joyce Eckhoff

Amount Funded: \$10,000

Objective:

To produce improved durum germplasm for development of varieties for Montana producers.

Title: Redistribution of Wheat Stem Sawfly parasitoids for Inoculative Establishment

Institution: MSU

Department: MSU/Plant Sciences and Plant Pathology

Principal Investigator: Wendell Morrill

Amount Funded: \$10,000

Objective:

To establish a pilot program to inoculatively release sawfly parasitoids on farms where there is a high level of sawfly damage and evaluate their success. This will be in direct collaboration with selected wheat producers and wheat grower organizations.

Title: Ag Bioscience Mathre Courtyard and Signature Arch

Institution: MSU

Department: MSU/Plant Sciences and Plant Pathology

Principal Investigator: John Sherwood

Amount Funded: \$7,500

Objective:

Complete the Ag Bioscience Courtyard and steel design arch structure which incorporates the architect's abstract "wheat head" design that was utilized in the design of the building.

Title: New Rotation Crops for Sustainability of Farms and Ranches in Central Montana

Institution: MSU

Department: MSU/Central Agricultural Research Center

Principal Investigator: Chengci Chen

Amount Funded: \$5,500

Objectives:

The goal of this proposed project is to identify new canola and lupine varieties for Montana's environments to establish a sustainable and economically viable cropping system. The specific objectives are to:

- 1) Evaluate new regular and specialty canola genotypes from public and private breeders, from various regions of U.S. and Canada, for adaptation.
- 2) Evaluate narrow leaf lupine genotypes, from Australia and Poland, for adaptation and yield potential in central Montana.

Title: Wheat Stem Sawfly Parasitism and its Effect on Wheat Physiology and Stress

Institution: MSU

Department: MSU/Entomology and Institute for Bio-Based Products and Food Science

Principal Investigator: Bob Peterson

Amount Funded: \$5,000

Objective:

Characterize and compare physiological responses of wheat to parasitized and unparasitized sawfly larvae.

Title: Underwriting Support for “Montana Ag Live!”

Institution: MSU

Department: MSU/Plant Sciences and Plant Pathology

Principal Investigator: Jack Riesselman

Amount Funded: \$2,500

Objective:

Re-establish underwriting support for “Montana Ag Live!”, one of Montana public television’s most popular programs, where a special guest is highlighted every Sunday night and a wide variety of agricultural topics is covered and followed by a question and answer period. In addition to a guest each week, a standard three-member panel is maintained, comprised of University specialists in Plant Pathology, Agronomy, Weed Science, Horticulture, Soil Fertility and Entomology.

Title: Ag Appreciation Weekend 2003

Institution: MSU

Department: MSU College of Agriculture

Principal Investigator: Dean’s Office

Amount Funded: \$1,000

Objective:

Provide students in the College of Agriculture at MSU the opportunity to participate and represent MSU at judging contests, annual meetings and other important events by raising funds during MSU’s Ag Appreciation Weekend, November, 2003, through corporate sponsorships and donations, and to showcase agriculture in Montana during Ag Appreciation Weekend.