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Project ID: 0506-ST-088   **FY04 ARS Agreement #:** 59-0790-4-107

Research Area: EDM   **Duration of Award:** 1 Year

Project Title: Environmental Factors Influencing Scab of Barley in the Northern Great Plains.

PROJECT 2 ABSTRACT
(1 Page Limit)

Research is proposed that investigates the relationships between *Fusarium* head blight (FHB, or scab) of barley and environmental parameters. The research is a collaborative effort between researchers at South Dakota State University, North Dakota State University, University of Minnesota, and Pennsylvania State University to collect data from numerous locations in the Northern Great Plains and begin development of barley scab forecasting models for use in predicting epidemics of the disease. Currently, no predictive systems are in place for barley scab and the need exists in many locations in the U.S. With the limited options available for chemical control of FHB and the low level of resistance in adapted varieties, additional management tools are needed. Development of predictive modeling systems for FHB will provide producers with a tool for decision support of fungicide control or grain marketing management. Sixteen study sites throughout ND, SD, and MN will be monitored for barley scab development, plant growth stage, toxin accumulation, and environmental parameters. Data from these locations will be analyzed and screened by scientists at SDSU for strong relationships between environment and disease/toxin variables. The primary objective of the research is to establish a database of barley disease information with associated weather data and to begin variable exploration work on barley scab model development. A second objective is to utilize this multi-environment data to validate current wheat FHB models in use around the U.S. for use in barley FHB prediction. The wheat models may be of use to barley producers, but have not yet been tested for such purposes. Data and results of preliminary model development will be shared with researchers at Pennsylvania State University for advanced model manipulation and for potential delivery though infrastructure already in place. We propose this initial phase of funding to lay the groundwork for database development and, potentially, for adaptation of wheat scab models to barley situations. It is our intention to continue this project for at least three years, depending on funding availability, in order to collect sufficient location-years for development of strong barley scab models.