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Research Area: EDM

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Project Title: FHB Forecasting, Model Validation and Inoculum Dynamics in South Dakota.

PROJECT 1 ABSTRACT

(1 Page Limit)

Fusarium head blight (FHB) has continued to reduce yield and quality in much of the wheat growing areas of the U.S. and Canada. Progress has been made in development of weather-based FHB risk assessments, and improvements have been made in our ability to predict FHB epidemics in fields in multi-state tests across South Dakota, North Dakota, Ohio, Indiana, and Pennsylvania. The initial phases in developing the risk-assessments focused on collection of environmental data, field disease data and airborne inoculum data as well as on model development. While this process continues, additional aspects of the FHB disease cycle have been included and they have served to refine models and improve the applicability of the models to current production practices. Producers and researchers have noted the persistence of economic levels of FHB in many areas, even when environmental conditions were not conducive to epidemic levels (widespread severity >10%) of the disease. Because FHB has persisted in a chronic manner in much of the region, a multi-state collaboration has begun investigating the effect of local inoculum dose on FHB incidence and severity under less-than-epidemic conditions. The objective (Obj. #1) is to determine the effect of low, medium, and high levels of natural FHB inoculum on disease incidence/severity, % *Fusarium* damaged kernels (FDK), and toxin levels in grain from field plots. Initial results from some locations suggest a positive correlation of residue inoculum levels and field disease levels. A second year of this study is proposed. A second proposed objective (Obj. #2) is to continue data collection on environmental parameters and field disease from around the state for validation of currently proposed models, and also for development of new models. As part of this objective, cooperation with the South Dakota State Climatologist has been proposed and includes expanding the current weather data set obtained through that office. Additionally, this objective would provide support to a wide-area (multi-state) FHB risk assessment/forecast system in development at Pennsylvania State University. This system will be applicable to growers across the FHB-affected regions of the country including South Dakota. All objectives address specific research priorities of the USWBSI Epidemiology and Disease Management Research Area including those relating to the disease epidemiology, pathogen biology/ecology, and integrated disease management.