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Project Title: FHB Forecasting and Model Validation for Spring Grains in South Dakota.

PROJECT 1 ABSTRACT

(1 Page Limit)

Fusarium head blight (FHB) of wheat continues to occur at epidemic levels in locations throughout the Northern Great Plains and the Midwest/Cornbelt regions of the United States. Forecasting models and delivery systems have been developed through the USWBSI. The overall success of these systems is still under scrutiny but each system has had successes and failures on a local basis. There is a desire to enhance the effectiveness of FHB forecasting for spring wheat grown in North Dakota (ND), South Dakota (SD), and Minnesota (MN). Research is proposed that will aid in the development and validation of accurate FHB risk advisory/forecasting model systems. Uniform protocols conducted in five states (ND, SD, Indiana, Ohio, and Pennsylvania) will be directed at one multi-component objective: determining the effect of inoculum abundance, host resistance, fungicide, and weather on *Fusarium* head blight of wheat. A secondary objective is to collect data for continued development and validation of FHB forecast models. Plots will be established to: investigate low and high levels of inoculum from crop residues; fungicide vs. no fungicide; and susceptible vs. moderately resistant cultivar in relationship to FHB development under field environments. The hypothesis is that each of these factors will interact with weather to influence the severity of FHB; and that the disease limiting effects of low inoculum, fungicide application, or resistant cultivar will be mediated by highly conducive disease environment, or will be more evident when environments are less favorable for disease. Additional research is proposed, for SD, to investigate the accuracy and effectiveness of current wheat FHB models for spring wheat situations. Disease, inoculum, and weather data will be collected at numerous sites in Northeast South Dakota. This data set will be compared to predictive model output for the same region. The results will be utilized to validate, or to highlight weaknesses of current models. Finally, data analysis pertinent to the development of spring wheat FHB forecasting systems will be conducted at SDSU, using data sets generated from several years of FHB monitoring throughout ND, SD, and MN.