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Project Title: Incorporating Infection Cycle Components into FHB and DON Prediction Models.

PROJECT 3 ABSTRACT

(1 Page Limit)

Fusarium Head Blight (FHB) continues to be a concern in many wheat and barley production regions of the world. Through collaborative research funded by the USWBSI, Web-based risk assessment models were developed and deployed in 2004 for wheat to provide timely predictions of FHB risk in 24 states. In keeping with the U.S. Wheat and Barley Scab Initiative's research priority of developing the next generation of FHB and DON forecasting systems, the epidemiology group initiated the development of mechanistic risk assessment models in 2007. This provides the conceptual framework necessary to address additional sources of variation and further improve model accuracy. Current objectives of the cooperative epidemiology group are to: (1) improve the accuracy of empirical models for FHB by adding variables describing the impact of variety resistance and local sources of inoculum on the risk of disease epidemics in winter wheat and (2) continue the development of mechanistic models of FHB epidemics and DON accumulation by incorporating model components that describe: the probability of infection and DON accumulation when inoculum is not limiting and the influence of interactions between inoculum density, environment and variety resistance on disease severity and DON concentration. To achieve these objectives, multiple experiments will be conducted by the epidemiology group (ND, SD, KS, NE, and OH) according to standard protocols, using three locally adapted varieties with similar maturity and different levels of resistance to FHB in order to obtain data for model development.