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Project Title: Effect of Inoculum Level on Fusarium Head Blight and Splash Dispersal of Gibberella zeae.

PROJECT 2 ABSTRACT
(1 Page Limit)

Fusarium Head Blight (FHB) has continued to be an important disease in many wheat and barley production regions of North America. Critical information regarding factors that influence inoculum levels, dispersal of the causal fungi, and disease development are being investigated. Currently, weather variables are being used to predict economic scab risk potential in Ohio, Indiana, Missouri, Michigan, New York, Pennsylvania, South Dakota and North Dakota. Documented variability in the level of FHB among fields in a specific region implies that further refinements in forecasting models are necessary and that additional experiments are needed to clarify the relationships between environment, inoculum and disease intensity. We propose to investigate the role of varying crop residue levels on the incidence of FHB as part of a multi-state cooperative effort with researchers in ND, SD, IN, and PA for a second year. We plan to use the same protocols used last year including field plots with three levels of corn residue (0%, 15%, 80%) and two planting dates and three cultivars of differing maturity to determine if crop residue level influences inoculum abundance and disease level. Results from 2003 have indicated that there was little difference in the inoculum abundance or disease level within plots with varying corn residue levels. We will again monitor the environmental parameters within the plots during 2004 as well as determine the inoculum present in the air and on wheat heads in each residue level treatment. Results will indicate the overall significance of crop residues as a source of inoculum and data from weather and pathogen monitoring will be used to modify existing FHB risk forecasting models. Our second objective is to determine the role of rain splash in dissemination of *Gibberella zeae* inoculum. With initial funding in 2002 we determined that water droplets from rain splash in the field contained *G. zeae* propagules. During 2003 we expanded these studies to collect rain splash in the field with corn residues to a height of 100 cm. To further document and quantify the number of propagules being disseminated at various heights in the wheat canopy, we plan to continue these studies during the 2004 growing season. We will also continue studies using the single drop generator to impact drops of various sizes onto different sources of inoculum (corn stalk, wheat leaves) and use a phase droppler particle analyzer to measure the velocity and diameter of all generated drops to examine the ability of drops to disseminate ascospores and conidia. This information will help determine the significance of rain splash in the delivery of inoculum to wheat heads and will add to our basic understanding of inoculum dispersal in a wheat canopy. Additionally, we anticipate the next generation of FHB forecasting models to be ready for evaluation in 2004 growing season. Moreover, we plan to work with Dr. Erick De Wolf and meteorologists at Penn State University to develop the infrastructure to improve the efficiency of model implementation and extend the domain of model delivery to a regional level.