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Research Area: EDM

Project Title: Airborne Propagules of *Gibberella zeae*: Their Genetic Diversity and Contribution to Fusarium Head Blight.

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PROJECT 2 ABSTRACT

(1 Page Limit)

The multi-year goal of this project is to determine where inoculum for Fusarium head blight (FHB) comes from and how far it travels. Functional inoculum for FHB may be limited to sources within or adjacent to local fields. At the other extreme, viable windborne propagules may be transported across broad geographic regions. The range and magnitude of aerial dispersal have important implications for the spread of new variants of the scab pathogen and for efficient deployment of scab control practices. The research necessary to address aerial dispersal is complex and incremental. We made excellent progress in the first year of our USWBSI project on "airborne propagules" and propose to extend these findings by utilizing tools of population genetics in a second year of USWBSI-supported research. We will determine DNA amplified fragment length polymorphisms (AFLP) on a random sample of *G. zeae* from a bank of over 5,200 field isolates collected at daily intervals before, during, and after local wheat flowering in 2002: from the air (via remote controlled airplanes, and settling plates located just above the wheat canopy), from selectively exposed wheat heads, and from local corn debris. We will characterize the genetic diversity of airborne populations of *G. zeae*, and determine their contribution to Fusarium head blight in wheat. Specifically we will: (1) examine the genetic diversity of populations of *Gibberella zeae* collected from the air; (2) observe the genetic diversity of populations of *G. zeae* rendered from diseased wheat heads; (3) identify the association of airborne isolates of *G. zeae* with FHB in wheat; and (4) evaluate the contribution of local sources of inoculum to random and aggregated FHB epidemics. This research complements other ongoing investigations in the USWBSI on epidemiology and disease management, and will undergird future research on regional aerobiology and epidemiology.