

Summary of the 1999 National Fusarium Head Blight Forum Epidemiology and Disease Management Breakout Session

The Epidemiology group divided into three subgroups: disease forecasting, pathogen survival, and pathogen genetics. Dr. Pat Lipps led discussions in the disease forecasting area, Ruth Dill-Macky led discussions in the pathogen survival area, and Anne Desjardins led discussions in the pathogen genetics group.

Disease Forecasting. The disease forecasting group discussed uniform collection methods for weather data and for monitoring the pathogen. They evaluated the various parameters of the weather data that is collected and attempted to prioritize the different types of information. Secondly, the group discussed alternative methods for monitoring pathogen propagules in the air around fields. Several sampling techniques were discussed, but it was concluded that the procedures used during the 1999 season were appropriate. Protocols for use during the 2000 season were outlined. The participants agreed that those performing disease forecasting research needed to get together for an Epidemiology workshop. Dr. Francl volunteered to help arrange a workshop for participants to occur sometime in the spring of 2000.

Pathogen Survival. This subgroup consisted of: Yue Jin (SD), Wayne Pederson (IL), Brenda Kennedy and Sam Markel (graduate students under the direction of Len Francl) (ND), Frances Trail (MI), Bill Bushnell (MN), and Ruth Dill-Macky (MN).

The participants discussed the research that is currently being conducted regarding pathogen survival and pathogen genetics.

- 1) Bill Bushnell's lab is working to identify infection pathways, including which spores are involved and the sites where penetration takes place.
- 2) Frances Trail's lab is studying the survival of *Fusarium* in corn debris and is interested in pursuing work on the discharge mechanisms of ascospores.
- 3) Ruth Dill-Macky's lab is interested in the survival and inoculum potential of *Fusarium* in relation to crop residue under different management practices.
- 4) Wayne Pederson is interested in modeling in regards to host residues to estimate the viable inoculum potential of various management practices including no-till.
- 5) Len Francl's lab is studying the release events of spores from crop residue. He is also looking at the environmental conditions that may influence spore release events.
- 6) Yue Jin is conducting studies on ascospore survival on wheat heads in the field.

Following the discussion of the research interests of the group, the participants identified a number of areas where future collaborative efforts could be focused.

Pathogen Genetics. Bob Bowden from Kansas State University coordinated the pathogen genetics groups on the topic of *Fusarium graminearum* genetics and variability. Anne Desjardins from USDA, Illinois kept a record of the group's discussion.

The group divided *Fusarium graminearum* genetics and variability into two major areas: population biology and functional genomics. They discussed fungal population sampling projects that are currently underway and concluded that the projects are largely complementary in their objectives, but that some coordination of DNA marker methods

would be useful. The participants expressed interest in developing models for fungal evolution, and particularly in fungal responses to selection mechanisms, such as host specialization and fungicide resistance. The discussion of functional genomics focused on methods of detection of fungal genes with functions in virulence. These included searches of fungal EST libraries for putative virulence gene homologues, gene deletions, and virulence gene mapping using classical genetics. The participants also expressed interest in investigating possible genetic bases of fungal strain variability and instability, such as karyotype instability or transposable elements.