

0203-LI-037 Disease Forecasting System for Fusarium Head Blight and the Splash Dispersal of *Gibberella zeae*.

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PROJECT ABSTRACT

(1 Page Limit)

Fusarium head blight (FHB) has caused significant yield losses in many wheat growing regions of North America. Critical epidemiological information is needed to make appropriate disease management recommendations. A disease forecasting system that provides wheat producers with timely management recommendations would be highly desirable. We recently developed a FHB risk assessment model based on weather conditions occurring before and during anthesis with a prediction accuracy of 84%. Published information and observations by researchers indicates that inoculum level present during anthesis, as well as weather conditions, may have a profound influence on disease intensity. We have been monitoring temperature, relative humidity, precipitation, soil moisture, residue moisture, solar radiation, wind speed and leaf wetness of the crop. Volumetric air sampling and disease assessments are conducted in replicated plots to monitor inoculum and disease severity levels. We are proposing to continue this weather and pathogen monitoring project for a third year in cooperation with researchers in North Dakota, South Dakota, Indiana and Pennsylvania to obtain a more complete data set on which to base a forecasting model. We are also proposing to participate with Pennsylvania in analysis of more than 40 location years of information obtained by the cooperative monitoring project over a three year period. Data analysis will include cluster and multivariate analysis in order to determine large-scale differences in disease, pathogen inoculum and environment among locations and years. The second phase of the overall analysis will focus on determining statistical relationships between measured variables. Data will be combined across locations to develop a disease forecasting model and the data will be used to validate and improve our current FHB risk assessment model. During 2001 we provided Ohio wheat growers with predictions of the scab risk via a web site and we plan to continue this during the 2002 growing season. Once a disease forecasting system has been developed and validated, management recommendations will be disseminated to wheat growers via the Ohio State University Extension Crop Observation and Recommendation Network and the Ohio State University Field Crop Disease web site. Our second objective is to determine the role of rain splash in dissemination of *Gibberella zeae* inoculum. We will collect water droplets from rain splash in a reduced tillage field with corn residue on the soil surface to document the presence of spores in splashed droplets and determine the quantity of spores being disseminated at various heights in the wheat canopy. We will also use a single drop generator to impact drops of various sizes onto different sources of inoculum (corn stalk, corn grain and wheat heads) and a phase doppler particle analyzer to measure the velocity and diameter of all generated droplets to examine the ability of drops to disseminate ascospores and conidia. This information will help determine 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.