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Project Title: Effect of Inoculum, Host Resistance, Fungicide, and Weather on FHB.

PROJECT 2 ABSTRACT

(1 Page Limit)

The goal of this project is to investigate the effects of inoculum abundance, weather, host resistance, and fungicide use on development of *Fusarium* head blight under natural field conditions. We wish to determine how a fungicide and partial resistance perform under weather conditions that differ in favorability for head blight. Now that cultivars with partial resistance and fungicides that can suppress head blight development are available to wheat producers, weather-based risk models need to be expanded to account for these additional factors. Additional data sets that include not only head blight severity in the field, but also abundance of airborne inoculum, severity of *Fusarium*-damaged kernels, and DON concentration in grain are needed to develop more reliable risk models.

Three soft red winter wheat cultivars will be planted at a Purdue research farm in Tippecanoe County, Indiana in a split-split plot design. Main plots are presence or absence of corn residue on the soil, sub plots are treatment or no treatment with Folicur fungicide at onset of flowering, and sub-sub plots are cultivar. One cultivar (Patterson) is relatively early flowering. The other two are later flowering; one (Hopewell) is susceptible to FHB whereas the other (Truman) is moderately resistant. Adjacent to this wheat experiment we will plant McGregor barley. Half of these plots will have no corn residue; the other half will have residue at the same density as in the wheat experiment. Airborne inoculum will be quantified each day by capturing spores of *Gibberella zae* with Burkard spore samplers (one in each residue treatment), and by washing and quantifying propagules from wheat heads each day in each residue treatment. Head blight incidence and severity will be monitored in each plot. Temperature, rainfall, relative humidity, wind speed and direction, and plant surface moisture will be monitored at 30-min. intervals throughout the growing season with a Campbell weather data logger. Harvested grain will be evaluated for yield, test weight, incidence of *Fusarium*-damaged kernels, asymptomatic infection, and DON content. We will also monitor head blight development in wheat cultivar trials at 5 locations around Indiana, and in wheat plots planted into corn residue. The same grain characteristics mentioned above will be determined for each plot. Hourly weather data are collected at each of these locations. Data from these experiments will be used to explore the relation between head blight intensity, grain quality traits, and DON content. All of these data sets will be used in the cooperative effort to refine weather-based risk prediction models and to evaluate the effect of corn residue on head blight development.