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Project Title: Uniform Fungicide and Biocontrol Agent Tests for Control of Fusarium Head Blight

PROJECT 1 ABSTRACT

(1 Page Limit)

The effect of fungicides on Fusarium head blight (FHB) and deoxynivalenol (DON) levels will be evaluated in Michigan on soft white wheat at Clarksville Horticultural Research Station in irrigated plots. To help ensure development of FHB, plots will be planted into fields that were previously cropped to a FHB-susceptible crop (i.e. corn, wheat, or barley), and/or *Fusarium graminearum* spawn (*F. graminearum* growing on a substrate; i.e. sterile corn or sorghum kernels) will be spread throughout the plots. Irrigation during head development through soft dough (Feekes 11.2) will be used to supplement natural rainfall to provide a favorable environment for *F. graminearum* infection and disease development.

The experimental design will be a randomized complete block with a minimum of 4 replications. Plot sizes will vary according to the cooperators' equipment and land space available, but plots will be at least 5 ft wide × 10 ft long. Fungicide treatments will be applied with a spray boom equipped with forward- and backward-facing nozzles (30° from the horizontal). The specific fungicide treatments to be evaluated will be determined at a meeting with the project participants during the 2010 Fusarium Head Blight Forum in Milwaukee, WI. It is expected that there will be approximately 10 uniform treatments to be applied across replicates at each location. Although the major thrust of the experiment will be to evaluate new fungicide chemistry and mixtures, standard treatments will also be included for comparison purposes (i.e. Folicur, Prosaro, Caramba, etc.).

At soft dough (Feekes 11.2), FHB incidence and severity will be assessed for each plot by examining 20 heads at 5 arbitrarily selected locations per plot, and FHB index will be calculated. Additionally, incidence and severity of foliar diseases will be assessed on the flag leaves at the same time. Plots will be harvested to determine yield, and grain samples from each plot will be evaluated for percentage Fusarium-damaged kernels. Grain samples from each plot will be sent to one of the USWBSI-funded DON testing laboratories for DON analysis.

Disease data to be collected from the experiment will include head severity (% spikelets infected per diseased head) and incidence (% heads infected per plot) determined from 40 heads per plot around 3 weeks after anthesis. Plot severity, or index, will be calculated from these data. Plots will be harvested for determination of total yield, 200 kernel weight, and incidence of Fusarium-damaged kernels. Samples from each plot will be sent to appropriate laboratories for analysis of DON content. All data will be analyzed statistically using SAS Proc Mixed, with data being arc-sine transformed when appropriate. Fisher's LSD test will be used for mean separation. Weather station data (air temperature, relative humidity, and rainfall) also will be obtained for the period from heading through grain-fill. This information will be useful in interpreting disease and DON results at each site.