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Project Title: Best Management Practices of FHB in Wheat using Host Resistance and Fungicides.

PROJECT 1 ABSTRACT

(1 Page Limit)

Reducing the damage caused by FHB is a major goal of the U.S. Wheat and Barley Scab Initiative and of vital importance to wheat and barley producers. While FHB resistant varieties are certain to play a major role in the control of damage from FHB, the most likely scenario is that the most effective way to minimize economic losses due to FHB will be though the integrated use of resistant varieties and management. The objective of this experiment is to examine the effectiveness of genetic resistance and fungicide application singly and in combination in reducing FHB symptoms, FDK and DON under heavy disease pressure. We will grow this experiment in our mist-irrigated, inoculated nursery so that the level of disease pressure should be severe. Many of the varieties and breeding lines included in this experiment are high yielding and are in commercial production. The three treatments applied to all of the varieties will be: no fungicide, Caramba® (metconazole), and Prosaro® (prothioconazole + tebuconazole). We will use a split-plot design with fungicide treatment as the main plots, and use four replications. We will also place buffer plots between fungicide treatments and thus further minimize undesirable effects due to spray drift. Three FHB susceptible varieties and nine FHB resistant varieties or breeding lines will be included in the experiment. The experiment will have four replications. Plots will be six row yield plots with rows spaced 7 inches apart. Plots will be 14 feet in length and trimmed to 8 feet prior to harvest. The plots will be managed for high yield potential. A fungicide will also be applied to all of the plants at Feekes GS 8 to control foliar diseases and thus minimize confounding the yield effects due FHB control with effects of foliar diseases. Grain spawn (corn kernels cultured with FHB) will be used to inoculate the nursery which will be mist-irrigated during flowering. Data will be collected on incidence, severity and percent FDK, FHB and ISK indexes will be calculated, and a grain sample from each plot will be sent to the lab at the University of Minnesota for DON evaluation. This experiment should provide data to address the question if either current levels of genetic resistance or fungicide application are able to provide enough protection to minimize losses due to FHB under heavy disease pressure. This experiment will also provide data to determine if strong genetic resistance and fungicide application in combination can provide better protection from losses due to FHB than either provides alone.