

PI: Paul, Pierce**PI's E-mail: paul.661@osu.edu****Project ID: FY08-PA-038****FY07 ARS Agreement #: 59-0790-4-112****Research Category: MGMT****Duration of Award: 1 Year****Project Title: Efficacy and Economics of Integrated Control Strategies for FHB and DON in Wheat.****PROJECT 1 ABSTRACT**

(1 Page Limit)

Fusarium Head Blight (FHB) continues to be a concern in many wheat and barley production regions of the world. Under favorable weather conditions, no single management practice has been fully effective against FHB and DON. Experiments will be conducted in Ohio, as part of a series of uniform integrated management trials involving researchers from major wheat-growing regions of the US, with the goal of evaluating the efficacy and economics of integrating multiple management strategies to reduce losses due to FHB and DON. The specific objectives are: **1)** evaluate the integrated effects of fungicide and variety resistance on FHB and DON, and perform an economic analysis of integrated and chemical management approaches, **2)** evaluate the influence of fungicide coverage and flowering synchrony as affected by planting density and row spacing on the overall efficacy of fungicide against FHB and DON, and **3)** integrate moderately resistant soft red winter wheat (SRWW) breeding lines into a management program for FHB and DON. These objectives will address the MGMT research priority of validating integrated management strategies for FHB and DON. For objective 1, field experiments will be conducted by cooperators following a standard protocol. The experimental design will be a split plot with 6 replicate blocks. Whole plots will consist of pairs of plots of six SRWW varieties - "Cooper" and "Pioneer 25R47", susceptible; "AG101" and "Hopewell", moderately susceptible; and "Truman" and "McCormick", moderately resistant. Sub-plot treatments will be established by applying Proline 3+3 (3 fl. oz. Folicur + 3 fl. oz. Proline) to one plot of each variety at early anthesis (Feekes GS 10.5.1) and leaving the other plot untreated. For objective 2, plots of "Hopewell" will be established in a split-split plot design, with 3 replicate blocks. Whole plots will consist of two row spacings: the standard 7.5-inch rows and 15-inch rows (used in relay intercropping); sub plots of three seeding rates (18, 23, and 28 seeds per foot of row); and sub-sub plot of fungicide treatments (with and without Proline 3+3 at GS 10.5.1). For objective 3, the experimental design and treatment layout will be similar to that described for objective 1, with the exceptions being moderately resistant SRWW breeding lines used instead of commercial variety and plots inoculated and mist irrigated. "Truman" and "Cooper" will be used as standards for comparison. FHB, yield, grain quality, and DON content will be assessed in all experiments. For Objective 1, data from all experiments will be combined and analyze to determine the overall efficacy of integrating resistance and fungicide for FHB and DON control. In addition, using these data, data from 10 years of uniform fungicide trials, a survey of wheat prices, FHB-related discounts, and wheat production-related costs for the last 10 years for each region, an economic analysis of chemical and integrated control strategies will be performed. For Objective 2 and 3, percent control (reduction in FHB and DON in treated plot relative to untreated plot) will be used to determine whether planting density and row spacing (directly or indirectly) contribute to more effective chemical control of FHB and DON, and to evaluate the SRWW breeding lines.