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Project Title: Efficacy of Miravis Ace in Combination with Resistance for FHB and DON Management

PROJECT 1 ABSTRACT

(1 Page Limit)

The overall goal of this project is to evaluate the efficacy of a new fungicide, Miravis Ace, against Fusarium head blight (FHB) and deoxynivalenol (DON) in soft red winter wheat (SRWW) in Ohio. The specific objectives are to: **1.** Evaluate the integrated effects of fungicide treatment and genetic resistance on FHB and DON, with emphasis on the new fungicide, Miravis Ace®; **2.** Compare the efficacy of Miravis Ace when applied at early heading (Feekes 10.3) or at early anthesis (Feekes 10.5.1) to that of standard Feekes 10.5.1 applications of Prosaro® and Caramba®; **3.** Compare the efficacy of single and sequential applications of Miravis Ace, Prosaro, Caramba, and tebuconazole against FHB and DON; **4.** Determine the effects of rainfall timing, amount, and duration on the efficacy and residual life of Miravis Ace, Prosaro, and Caramba on wheat spikes; **5.** Determine the optimum growth state for *F. graminearum* infection and fungicide application for FHB control in winter malting barley. For **Obj. 1**, four cultivars with different levels of resistance to FHB will be subjected to six treatments: **1)** an untreated check; **2)** Prosaro at Feekes 10.5.1; **3)** Miravis Ace at Feekes 10.5.1; **4)** Miravis Ace at Feekes 10.3; **5)** Miravis Ace at Feekes 10.5.1 followed by (fb) tebuconazole at 4-6 days after anthesis (DAA); and **6)** an untreated, non-inoculated check. For **Objs. 2 and 3**, plots of a susceptible cultivar will be subjected to nine fungicide treatments: **1)** an untreated check; **2)** Prosaro at Feekes 10.5.1; **3)** Caramba at Feekes 10.5.1; **4)** Miravis Ace at Feekes 10.3; **5)** Miravis Ace at Feekes 10.5.1; **6)** Miravis Ace at 4-6 DAA; **7)** Miravis Ace at Feekes 10.5.1 fb Prosaro at 4-6 DAA; **8)** Miravis Ace at Feekes 10.5.1 fb Caramba at 4-6 DAA, and **9)** Miravis Ace at Feekes 10.5.1 fb tebuconazole at 4-6 DAA. For **Obj. 4**, separate plots of a susceptible wheat cultivar will be treated with Miravis Ace, Prosaro, or Caramba at Feekes 10.5.1, or left untreated, after which separate groups of plots will be subjected to simulated rainfall treatments of different durations (15, 30, 60, and 120 min), beginning at different times (0, 15, 30, and 60 min) after fungicide application. Fungicide treated plots not subjected to simulated rainfall and non-treated plots will be used as references for comparison. For **Obj. 5**, experiments will be conducted under controlled conditions. A single application of Miravis Ace will be made to separate cohorts of spikes at growth stages ranging from boot to hard dough, and then separate subsets of spikes in each treatment group will be spray inoculated with a spore suspension of *F. graminearum*, beginning 24 h after the boot stage fungicide application and continuing at 4-day intervals until hard dough. Where applicable, Prosaro, Caramba, Miravis Ace, and tebuconazole will be applied at label-recommended rates of 6.5, 13.5, 13.7, and 4 fl. oz./A, respectively, and FHB, DON, FDK, foliar diseases severity, yield, and test weight data will be collected.