PI: Martin Chilvers **PI's E-mail:** chilvers@msu.edu

Project ID: FY20-IM-006 **ARS Agreement #:** *59-0206-8-189*

Research Category: MGMT **Duration of Award:** 1 Year

Project Title: Integrated Management of FHB and DON in Soft White Winter Wheat and Winter Barley in Michigan

PROJECT 1 ABSTRACT

(1 Page Limit)

The Objectives of this FHB Management Coordinated Project (MGMT_CP) are to:

1) Evaluate the integrated effects of fungicide treatment and genetic resistance on FHB and DON in all major grain classes, with emphasis on a new fungicide, Miravis® Ace,
2) Compare the efficacy of Miravis Ace when applied at early heading or at anthesis to that of standard anthesis application of Prosaro® or Caramba®,
3) Generate data to further quantify the economic benefit of FHB/DON management strategies;
4) Develop more robust "best-management practices" for FHB and DON; and
5) Generate data to validate and advance the development of FHB and DON risk prediction models.

We propose to repeat the same IM and UFT trials in wheat and barley, with a few minor changes, for two additional growing seasons. For the wheat IM trial, all PIs will conduct inoculated experiments using at least two cultivars with different levels of resistance to FHB and at least six fungicide treatments: 1) an untreated check; 2) Prosaro at anthesis; 3) Miravis Ace at anthesis; 4) Miravis Ace at Feekes 10.3; 5) Miravis Ace at anthesis followed by (fb) tebuconazole at 4-6 days after anthesis (DAA); and 6) an untreated, non-inoculated check. In addition to the IM trial, a subset of the PIs will conduct inoculated, mist irrigated UFTs. For wheat, plots of a susceptible cultivar will be subjected to at least nine fungicide treatments: 1) an untreated check; 2) Prosaro at anthesis; 3) Caramba at anthesis; 4) Miravis Ace at Feekes 10.3; 5) Miravis Ace at anthesis; 6) Miravis Ace at 4-6 DAA; 7) Miravis Ace at anthesis fb Prosaro at 4-6 DAA; 8) Miravis Ace at anthesis fb Caramba at 4-6 DAA, and 9) Miravis Ace at anthesis fb tebuconazole at 4-6 DAA. Similar protocols will be used for barley IM and UFT trials, with full head emergence (Feekes 10.5) as the standard and reference application time. In all trials, Prosaro, Caramba, Miravis Ace, and Tebuconazole will be applied at 6.5, 13.5, 13.7, and 4 fl. oz./A, respectively, along with a non-ionic surfactant.

Meta-analysis will be used to conduct a quantitative synthesis of the data. Results from these trials will allow us to evaluate the efficacy of Miravis Ace at different timings relative to the industry standards Prosaro and Caramba, as well as generate data for validation and refinement of the FHB risk assessment tool.