

Project Abstract

Project Title:	Integrating Strategies to Mitigate Fusarium Head Blight and DON in Winter Wheat	
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The overall goal of this research is to integrate cultivar resistance with fungicide application to effectively manage FHB and DON in winter wheat. The specific objectives are:

- 1) Evaluate the integrated effects of fungicide treatment and genetic resistance on FHB and DON in winter wheat, with emphasis on new combination fungicides, Prosaro Pro[®] and Sphaerex[®].
- 2) Compare the efficacy of Prosaro Pro and Sphaerex to that of Prosaro[®], Caramba[®], and Miravis Ace[®].
- 3) Generate data to further quantify the economic benefit of FHB and DON management programs.
- 4) Generate data to validate and advance the development of FHB risk prediction models.

A field experiment will be conducted to investigate the effects of cultivar resistance and fungicide application on FHB and DON in winter wheat. The experiment will be located at the University of Nebraska Havelock Research Farm near Lincoln, Nebraska. The experimental design will be a split plot in randomized complete blocks with four replications, with cultivars as whole-plots and fungicide x inoculation treatments as sub-plots. Four cultivars adapted to Nebraska will be used: Overland (moderately resistant), Zenda (moderately resistant), Siege (susceptible), and Wesley (susceptible). The fungicide x inoculation treatments will be 1) untreated, inoculated check; 2) Prosaro (6.5 fl. oz.) at anthesis, inoculated; 3) Miravis Ace (13.7 fl. oz.) at anthesis, inoculated; 4) Prosaro Pro (10.3 fl. oz) at anthesis, inoculated; 5) Sphaerex (7.3 fl. oz.) at anthesis, inoculated; and 6) untreated, non-inoculated check. Fungicides will be applied with a CO₂-powered backpack sprayer equipped with four Teejet 800-1 VS nozzles and calibrated to deliver 20 gallons of fungicide-water mixture per acre. In treatments 1 to 5, plots will be spray-inoculated with spores of *Fusarium graminearum* (1×10^5 spores/mL) 24 hours after fungicide application at early anthesis. Corn kernel inoculum will be spread weekly on the soil surface starting at three weeks before anthesis. FHB intensity will be assessed at the soft dough growth stage. At and following harvest, yield, test weight, *Fusarium*-damaged kernels (FDK), and DON concentration will be determined. A weather station at the experiment site will record weather data starting in mid-April through harvest. Results from the research will be disseminated to growers, crop consultants, stake-holders, and the public through mass media and presentations at state and national meetings. This education/outreach will result in reduced losses to FHB and DON, increased profits for growers, and high quality wheat grain.