Project Abstrat

Project Title:	**Fungicide and Genetic Resistance for FHB and DON Management on Winter Wheat in Ohio**	
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The overall goal of this project is to develop programs for FHB and DON management in soft red winter wheat in Ohio that are effective, robust to field conditions, and economically beneficial. The specific objectives are to: 1. Evaluate the integrated effects of fungicide treatment and genetic resistance on FHB and DON, 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. determine the additivity of mixtures and sequential applications of fungicides for FHB and DON management; and 4. determine the rainfastness of Prosaro Pro, Sphaerex, Prosaro, Caramba, and Miravis Ace. For Obj. 1, replicate plots of cultivars with different levels of resistance to FHB will be either left 1) untreated and inoculated, 2) untreated and not inoculated, or treated with the fungicides 3) Prosaro; 4) Miravis Ace; 5) Prosaro Pro; or 6) Sphaerex at Feekes 10.5.1. For Obj. 2 and 3, replicate plots of a susceptible cultivar will be either left untreated or subjected to eight fungicide programs consisting of Feekes 10.5.1-only or sequential applications of the fungicides tested under Obj 1, as well as Caramba, Proline, and Folicur. For Obj 4, separate replicate plots of a susceptible cultivar will be treated with the six fungicides at Feekes 10.5.1, with or without a non-ionic surfactant, and subjected to simulated rainfall treatments. Fungicide treated plots not subjected to simulated rainfall and non-treated plots will be used as references to estimate rainfastness. Plots in all experiments will be inoculated, except the non-inoculated checks in Obj 1. All fungicides will be applied at label-recommended rates, and FHB intensity, DON contamination, percent *Fusarium* damaged kernels, foliar disease severity, grain yield, and test weight data will be collected. We expect the greatest efficacy when a fungicide treatment is integrated with genetic resistance (Obj 1); comparable efficacy among the five fungicides and greater efficacy with sequentially applied treatments (Obj 2); fungicide mixtures and sequential applications will have additive effects on FHB and DON (Obj 3); and the tested fungicides will be rainfast when applied with a surfactant, but rainfastness will depend on rainfall treatment. Finding from this study will provide stakeholders with information regarding the most effective management programs against FHB and DON, efficacy of the new fungicides relative to the industry standards, and robustness of treatment programs to FHB-favorable field conditions such as rainfall during anthesis.