

Project FY22-IM-002: Testing Fungicide Efficacy & Timing in a High-performance North Carolina FHB Nursery

1. What are the major goals and objectives of the research project?

Provide results based on replicated field data to answer questions about optimal timing for fungicide to reduce FHB in winter barley.

2. What was accomplished under these goals or objectives? *(For each major goal/objective, address these three items below.)*

What were the major activities?

We conducted a 4-year field experiment in our misted, inoculated FHB nursery at Raleigh, North Carolina, using three winter barley cultivars with different levels of resistance to FHB: Violetta (MR), Thoroughbred (MR/MS), and Flavia (S). All are medium- to late-maturing malting barley varieties that are in commercial cultivation and are being used in breeding programs. Violetta and Flavia are medium-late two-row varieties, while Thoroughbred is a medium-maturing six-row type that (unusually) has acceptable malt quality. Inoculation was with *Fusarium*-infected corn spawn applied in three batches at one-week intervals, starting approximately three weeks before anticipated heading of the earliest variety (Thoroughbred).

We used ten fungicide treatments. The treatments allowed comparisons of the efficacy of Miravis Ace to those of Prosaro and Caramba, and comparisons of three fungicide timings (spikes half emerged, spikes just fully emerged, and 6 days after spikes fully emerged). They allowed estimation of the mean benefits of fungicide application, cultivar resistance, and the combination of the two in terms of yield, test weight, and DON reduction.

What were the significant results?

Late applications are more effective than early applications or applications at 100% heading. Early applications are statistically similar in DON concentration to the unsprayed control treatment.

List key outcomes or other achievements.

Please see above.

3. What opportunities for training and professional development has the project provided?

Our technician John Banask has learned about growth stages and fungicide applications in winter barley.

4. How have the results been disseminated to communities of interest?

- Article in *Plant Disease* that was named an Editor's Pick
- Scabinar presentation on fungicide timing in winter barley, 3/14/24
- Presentation of results at field days in North Carolina: Union County 2/21/24 and Piedmont Field Day in Salisbury, 3/14/24

5. What do you plan to do during the next reporting period to accomplish the goals and objectives?

Disseminate the information via scab forecasting alerts, field days.