Project FY22-DU-001: The Value of Genetic Resistance and Fungicides on the Control of FHB in Durum in ND

---

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

The goal of this project is to provide farmers the data they need to adopt improved FHB management practices in durum production in North Dakota.

Specific objectives are:

1. Evaluate yield and DON in durum variety by fungicide trials under misted and dryland conditions at Langdon and Prosper, ND, respectively.
2. Extend information learned from these experiments at grower meetings and in extension publications.

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

What were the major activities?

Evaluate yield and DON in durum variety by fungicide trials under misted and dryland conditions at Langdon and Prosper, ND, respectively.

- 2023 durum variety x fungicide trials were conducted at the Prosper research site in Cass County, ND and at the Langdon Research Extension Center located in Cavalier County, ND. The experiment was conducted as a split plot design replicated 3 times in each location. The Langdon site received regular misting via an in-field sprinkler system; Prosper received no supplemental water and was managed as a dryland site. Trials at both locations had corn inoculum applied to increase disease pressure.

- 2024 durum variety x fungicide trials were established at both locations and managed as in 2023. At the time of writing this report, in-season data collected have not yet been processed.

What were the significant results?

2023: The Prosper site experienced hot and dry conditions in June and we expected low levels of FHB infection and DON. Yield between fungicide treated and non-treated plots were not different with treated plots averaging 68.7 bu/a and untreated averaging 74.7 bu/a. There was a difference in yield by variety with ND Stanley, ND Grano, and Carpio (77.9, 75.6, and 75.5 bu/a, respectively) yielding more than the NDSU experimental line D111068 and Divide (63.7 and 65.3 bu/a, respectively). There was a difference in DON between treated and untreated plots with ($p<0.1$) with treated plots having 0.0 ppm and untreated 0.1 ppm. At Langdon, DON averaged 4.9 ppm in untreated plots and 0.8 ppm in treated plots. Yield averaged 72.1 bu/a in untreated plots and 79.0 bu/a in treated plots.

2024: At the time of writing this report, data were not available for reporting from the current year's experiments. We note that both locations had a much wetter May and June than in 2023 and are expecting to see high disease pressure at both locations.

List key outcomes or other achievements.

Data from this project were presented at the American Society of Agronomy meeting in November, 2023 in St. Louis to an audience of agronomists and researchers from different regions of the US and Canada. Data were also shared at the 2023 National FHB Forum in Cincinnati.

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

PI Dr. Clair Keene attended the National FHB Forum for the first time in 2023. This was an excellent professional development opportunity for her as it provided an unique opportunity to connect with other scientists researching FHB across a range of disciplines. Additionally, undergraduate student interns who worked for Dr. Keene's program during the growing season received training in identifying FHB in the field and determining disease incidence and severity as part of this project.

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

- Oral presentation (Keene) of results to approximately 70 farmers and ag industry professionals at the Langdon Research Extension Center annual field day in Langdon, ND. Jul 2023.
- Oral presentation (Keene) of results at the Agronomy Society Meeting (TriSocieties) Annual Meeting in St. Louis, MO. Nov 2023.
- Poster presentation (Keene) at the National FHB Forum in Cincinnati, OH. Dec 2023.

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

1. We have the goal of including selected results of this study in the "North Dakota Durum Wheat Variety Trial Results for 2024 and Selection Guide" (A1067-24) with an expected publication date of November 2024.
2. Present results at grower meetings and extension events during the fall and winter of 2024-2025.
3. Present a summary of the data to Dr. Elias Elias the NDSU durum wheat breeder and discuss how results can be used by the NDSU durum wheat breeding program.