

**Project FY22-BA-004:** Evaluation of Winter Barley Commercial Cultivars and Breeding Lines for FHB

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

**Project Goals:** Evaluation of Fusarium head blight (FHB) reaction in local commercial varieties of barley is critical for growers. At the same time, barley breeders need to evaluate their breeding germplasm for FHB resistance and DON accumulation for developing resistant varieties. PI will conduct misted nursery to evaluate local commercial cultivars and breeding germplasm for their response to FHB and DON accumulation. Barley is most susceptible to FHB at heading stage. However, heading times of barley genotypes/cultivars vary in natural conditions due to differences in their genetic background. Moreover, weather conditions may not be favorable for FHB every year. The misted nursery will help to avoid these issues by consistently maintaining favorable conditions for FHB infection over a longer period. **The overall project goal is to analyze barley breeding germplasm and commercial cultivars for their genetic resistance to FHB and DON accumulation.**

**Project Objectives:**

1. Conduct misted nursery for evaluating FHB resistance and DON accumulation in NABSEN barley breeding lines
2. Evaluate local barley varieties from the Mid-Atlantic region in the misted nursery.

The misted nursery data generated will help: a)-breeders in selecting FHB resistant breeding germplasm, and b)- growers in the Mid-Atlantic region in selecting high-yielding barley varieties with moderate resistance to FHB and DON.

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

**What were the major activities?**

Misted nursery was conducted at Beltsville Research station of the University of Maryland for screening NABSEN lines in headrows, and local barley varieties in small plots. FHB severity and incidence data were collected on the germplasm. Samples were prepared for their DON content analysis and shipped to Dr. Yanhong Dong at Minnesota. The proposed activities were conducted as per the proposed timelines in the project. The data was provided to the stakeholders and the NABSEN team in the FY 2023.

**What were the significant results?**

The FHB indices and DON data on barley commercial varieties were published as Factsheet for the year 2023. The results were disseminated to the growers and stakeholders in commodity board meetings and via emails. The NABSEN data was provided to the coordinator Dr. Tom Baldwin and Dr. Eric Stockinger.

**List key outcomes or other achievements.**

Key outcomes were disease ratings and DON contamination measurement. Some lines in the barley trial and NABSEN head rows had lower FHB severity, indices and DON content as compared to others.

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

A master's student, one PostDoc, and two undergraduate students were involved in the field work. Two minority high school students were also trained in the project on field diseases. All the trainees worked with the PI to conduct the nursery, collect and analyze data. The graduate students and PostDocs also participated in conferences and commodity board meetings with their work.

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

The PI presented the results in oral presentations and disseminated updates on FHB in wheat and barley through emails. The graduate students in the team presented the results as posters and handouts to the stakeholders in commodity board meetings. The results were published as Barley disease Factsheets and were disseminated via emails and the UMD extension system to the broader grower community.

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

Over the next reporting period, we will plant the NABSEN material in replicated head rows if possible in October. We will plant barley variety trial plots in three replications also in October. Misted nursery will be set up in March. FHB severity and incidence data will be recorded in May and DON data will be generated in June. The data will be made available to the NABSEN team and the growers as soon as it is available.