

Project FY22-FS-002: Diagnostic Services for DON

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

The goal of this project is to provide rapid, cost-effective, and accurate mycotoxin analysis - especially deoxynivalenol (DON) - for Fusarium Head Blight (FHB or scab) research projects.

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

What were the major activities?

Analyzed DON and related mycotoxins, such as 15-Acetyl-DON, 3-Acetyl-DON and Nivalenol, in wheat, barley and fungal culture extract using GC-MS and prepared purification columns.

What were the significant results?

From May 1, 2023, to April 30, 2024, our laboratory analyzed 24,706 samples submitted by 42 research groups from 22 states including Arkansas, Georgia, Idaho, Indiana, Illinois, Kansas, Kentucky, Louisiana, Maryland, Michigan, Minnesota, Missouri, Montana, New York, North Carolina, North Dakota, Ohio, Pennsylvania, South Dakota, Texas, Washington, and Wisconsin. The samples included 23,204 regular mature grain samples (4 -100 g) and 1,502 small size samples such as grain samples less than 4 g (1,330), wheat root (16), and fungal culture extracts (156). The target toxins included DON, 15-Acetyl-DON, 3-Acetyl-DON, and nivalenol.

List key outcomes or other achievements.

The DON data has been used in all areas of scab research. By analyzing mycotoxins, the project provided support to barley and wheat breeding programs to develop resistant varieties, and to researchers to study disease mechanisms and to develop effective chemical and biological disease controls. Mycotoxin data provided to scab researchers by our laboratory gave them a means to evaluate the effectiveness of their efforts in fighting Fusarium Head Blight.

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

Provided fund for PI, Yanhong Dong, to attend the 2023 National FHB Forum held in Cincinnati, OH between December 3-5, 2023.

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

The results were emailed to researchers and were then disseminated to communities of interest via conference papers and presentations, and journal publications.

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

The practices in our lab have been proven being successful in supporting the FHB research projects. We will continue to do the same.