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**ARS Agreement #: 59-0206-4-023**

**Research Category: FST**

**Duration of Award: 1 Year**

**Project Title: Diagnostic Services for DON.**

### **PROJECT 1 ABSTRACT**

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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.

The project will use gas chromatography-mass spectrometry (GC-MS) to provide quick and accurate measurement for: 1) DON and related mycotoxins, such as 3-acetyl-DON, 15-acetyl-DON and nivalenol (NIV); 2) Zearalenone for the projects approved by the executive committee; 3) mycotoxins in mature wheat and barley seeds as well as individual kernel, spikelet, head, small leaf and stem fragment at different disease development stages and fungal culture extracts; 4) 30,951 DON samples for 40 FHB research groups from 21 states including Arkansas, Delaware, Georgia, Idaho, Illinois, Indiana, Kansas, Kentucky, Louisiana, Michigan, Minnesota, Missouri, New York, North Carolina, North Dakota, Ohio, Pennsylvania, South Dakota, Tennessee, Texas, and Wisconsin.

The DON data provided by the services is essential to breeding (traditional and molecular) projects aiming at developing wheat and barley varieties with improved resistance to the disease and DON contamination. The services have been used for epidemiology, genetics and molecular studies of the host, pathogen, and host-pathogen interaction aiming at improving our understanding of the biology of the disease as well as developing effective disease control practices. The services have also been used to assist the developments of other rapid DON screening methods such as IR and Raman. The mycotoxin data provided to FHB researchers by the services gives researchers a means to evaluate the effectiveness of their efforts in fighting Fusarium Head Blight.