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Project Title: Diagnostic services for DON

PROJECT 1 ABSTRACT

(1 Page Limit)

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 extract; 4) 38,693 DON samples for FY20 from 43 FHB research groups and 22 states including Arkansas, Georgia, Idaho, Illinois, Indiana, Kansas, Kentucky, Louisiana, Maryland, Michigan, Minnesota, Missouri, Montana, 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) programs aiming at developing wheat and barley varieties with improved resistance to the disease and DON contamination, and has been used for epidemiology, genetics and molecular studies of the host, pathogen, and host-pathogen interaction aiming at improving our understanding of resistant mechanisms to FHB and mycotoxin production. The services have provided support to the efforts of developing integrated management strategies and effective disease control practices. The services have also assisted 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.