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Research Category: **FSTU** **Duration of Award: 1 Year**

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 analytical data provided by the services is essential to breeding (traditional and molecular) projects aimed at the development of wheat and barley varieties with improved resistance to the disease. The services have been used for epidemiology, genetics and molecular studies of the host, pathogen, and host-pathogen interaction aimed at improving our understanding of the biology of the disease as well as the development of disease control practices. A total of 29,217 samples was analyzed for DON and other mycotoxins such as 3-acetyl-DON (3-ADON), 15-acetyl-DON (15-ADON), nivalenol (NIV) and zearalenone (ZEA) by the project in the 2007/2008-crop year (from May 2007 to April 2008), which was 42.5% more than the estimate (20,500) presented in the proposal. The huge increase of samples reflected the great needs of DON analysis by the FHB research community. The samples were submitted by 34 FHB research groups from 14 states, including Minnesota, Kansas, Michigan, New York, Arkansas, Indiana, South Dakota, Illinois, Kentucky, Louisiana, Ohio, North Carolina, Maryland, and Virginia. Ergosterol, a chemical marker for measuring fungal biomass, was analyzed for some samples as requested by researchers. A survey indicates that 32,231 and 32,081 samples will be submitted to our laboratory for DON analysis in the 2009/2010 and 2010/2011, respectively.

The project will use gas chromatography-mass spectrometry (GC-MS) to provide quick and accurate measurement of DON and related mycotoxins in harvested grains as well as individual kernels, spikelets, heads, small leaf and stem fragments at different disease development stages. The single kernel analysis has been used to determine toxin development in the early stages of infection, and study resistance mechanisms in barley.