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Research Category: **FSTU** **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 DON data provided by the services is essential to breeding (traditional and molecular) projects aiming 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 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. A total of 29,350 samples were 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 2009/2010, which was slightly increased from last year (28,799), but was 8.9% (2881) less than the estimate (32,231) presented in the proposal due to sample adjustments by PIs. The samples were submitted by 35 FHB research groups from 15 states, including Arkansas, Idaho, Illinois, Indiana, Kansas, Kentucky, Maryland, Michigan, Minnesota, Missouri, Nebraska, New York, North Carolina, North Dakota, and Ohio. Ergosterol, a chemical marker for measuring fungal biomass, was analyzed for some samples as requested by researchers. A survey indicates that 37,057 samples will be submitted to our laboratory for DON analysis in 2011/12, which represents 15% increase as compared to last year's estimate. In fact, this is the highest amount of samples that we anticipate to receive in one year in our lab's history.

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.