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Research Area: **FSTU-S** **Duration of Award: 1 Year**

Project Title: Diagnositc 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 analytical data provided by the service is necessary for breeding (traditional and molecular) projects aimed at the development of wheat and barley germplasm with improved resistance to the disease. The service has 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 11,608 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 the 2005/2006-crop year (from 05/01/2005 to 4/30/2006). A method for analyzing ergosterol, a chemical marker for measuring fungal biomass, was developed in our laboratory, and ergosterol was analyzed for some grain samples as required by researchers. A survey indicated that about 12,500 samples would be submitted to our laboratory by the projects conducted in the University of Minnesota and the Cereal Disease Laboratory of USDA/ARS in 2007/2008. With the addition of a new GC-MS instrument, a projection of 8,000 more samples will be submitted to our laboratory by researchers outside Minnesota, and our laboratory anticipates analyzing ~20,500 samples in 2007/2008. FHB researchers will not be charged for the analysis.

The project will use gas chromatography-mass spectrometry (GC-MS) to provide quick and accurate measurement of DON and related mycotoxins in samples of 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.