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Project ID: FY08-DO-094 **FY07 ARS Agreement #: 59-0790-4-129**

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 analytical data provided by the service is necessary for breeding (traditional and molecular) projects aimed at the development of wheat and barley varieties 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 13,873 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 2006/2007-crop year (from 06/01/2006 to 5/31/2007). Ergosterol, a chemical marker for measuring fungal biomass, was analyzed for some grain samples as requested by researchers. A survey indicates that about 35,386 samples will be submitted to our laboratory for DON analysis in the 2008/2009 crop year. This is about the maximum amount of samples that our laboratory can handle with sufficient funds.

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.