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Project ID: FY07-MO-079

FY06 ARS Agreement #: 59-0790-4-095

Research Area: FSTU-S

Duration of Award: 1 Year

Project Title: Diagnostic Services for Vomitoxin (DON) in Wheat.

PROJECT 1 ABSTRACT

(1 Page Limit)

The presence of 'scab' or Fusarium Head Blight (FHB) in cereal crops reduces yield and quality of grain in the United States, Canada, and many countries world-wide. Numerous secondary fungal toxins or mycotoxins can be produced by *Fusarium sp.*, in particular *Fusarium graminearum*, and result in unacceptable grains for processing into edible foods or animal feeds. U.S. government guidelines exist for tolerances of deoxynivalenol in grains for human and animal consumption. The U.S. Wheat and Barley Scab Initiative initiated a program to develop plant breeding and management systems to reduce the incidence of scab. In a program of this type, there is a need for mycotoxin analyses on new varieties and processed food.

Project objectives are:

- 1) The Department of Veterinary Diagnostic Services at North Dakota State University will provide vomitoxin (deoxynivalenol or DON) analyses on approximately 8,000 to 9,000 wheat samples for about 20 to 25 scientists from central USA including North and South Dakota, Montana, Kansas, Arkansas, Colorado, Missouri, Iowa, and Nebraska. The gas chromatography/electron capture detector (GC/ECD) method used for vomitoxin analysis was developed at the Department of Veterinary Diagnostic Services and is quite selective. Samples are analyzed for vomitoxin, 15-acetyldeoxynivalenol (15-ADON), nivalenol and, by special request 3-acetyldeoxynivalenol (3-ADON). Cross-checks by gas chromatography/mass spectrometry (GC/MS) have shown a low incidence of false-positive results.
- 2) Veterinary Diagnostic Services has a GC/MS system for the trimethylsilyl derivatives of about 17 trichothecenes that are produced by *Fusarium sp.* This multi-mycotoxin screen, developed in the Veterinary Diagnostic lab and in place for over seven years, is available to screen for additional *Fusarium* mycotoxins that occur in cereals.

Relevance: The project is basic, but necessary, to determine the vomitoxin or DON concentrations in varieties for USWBSI plant breeders evaluating mitigation of FHB or scab.