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

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

PROJECT 1 ABSTRACT

(1 Page Limit)

The incidence of the fungal disease 'scab' or Fusarium Head Blight (FHB) in cereal crops reduces yield and quality of grain, both in the United States and Canada. Numerous secondary fungal toxins or mycotoxins can be produced by *Fusarium sp*., in particular *Fusarium graminearum*, and result in an unacceptable cereal commodity 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 strong 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.

The project, to be conducted in 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 25 scientists from North and South Dakota, 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. Cross-checks by gas chromatography/mass spectrometry (GC/MS) have shown a low incidence of false-positive results. As a secondary system, 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 is needed to guard against other mycotoxins, besides vomitoxin, being in the final varieties of wheat and barley. The laboratory is one of a few select labs in the USA that can provide this service promptly and at a reasonable price.

The laboratory employs an additional full-time chemist to help conduct large numbers of vomitoxin assays for USWBSI researchers and to perform the multi-mycotoxin analyses. The laboratory has 1 GC/ECD system and 2 GC/MS systems that can be used to achieve the goals of this project. The project is basic, but necessary, so that the wheat breeders can reach their final objective.