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Research Area: FSTU

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

PROJECT 1 ABSTRACT

(1 Page Limit)

Fusarium Head Blight, commonly referred to as 'scab', is a fungal disease that can reduce yield and quality of cereal crops in the United States and Canada. Fungal toxins, mycotoxins, may be produced by *Fusarium* and result in a cereal, such as wheat or barley, which is unacceptable for processing into flour or brewery products. Government guidelines exist for tolerances of deoxynivalenol in grains for human and animal consumption. The U.S. Wheat and Barley Scab Initiative has put together a strong program to develop breeding and management systems to reduce the incidence of scab. In any program of this type, there is a need for mycotoxin analyses on new varieties and processed food.

This 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 5000+ wheat samples for about 20 scientists from North and South Dakota, Minnesota, 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 20 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 relatively basic, but necessary, so that the wheat breeders can reach their final objective.