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Project ID: FY17-SE-001

ARS Agreement #: New

Research Category: FST

Duration of Award: 1 Year

Project Title: Deoxynivalenol (DON) Analysis in Wheat

PROJECT 1 ABSTRACT

(1 Page Limit)

Fusarium Head Blight (FHB), also known scab, is a disastrous fungal plant disease that has been effecting quality and safety of many small grains in North America and the rest of the world. FHB affects small grains negatively by causing significant yield loss, reducing grain quality and producing mycotoxins. In many regions, there are a limited number of suitable wheat varieties that have any effectual resistance to FHB infection. Many studies have identified that deoxynivalenol (DON) is the most detected Fusarium mycotoxin with FHB. The contamination of small grains by DON cause safety, quality and economic problems. DON is also called vomitoxin because of its harmful effects on human and livestock health. For example, humans consuming wheat products contaminated with DON may experience symptoms such as vomiting, headaches, fever and nausea. In addition, DON may have toxic effects on digestive systems of swine and other monogastric animals. USWBSI focuses on the development of plant genetics and management strategies to control occurrence of scab. With these goals in mind, there is a need for mycotoxin analyses on experimental lines and new varieties of wheat and processed food. The objectives would be: 1) Set up funds would be used to purchase major equipment and other laboratory supplies to establish large scale DON testing laboratories in Loftsgard Hall where Plant Sciences Department is housed; 2) After laboratory is prepared, Wheat Quality Laboratories in Plant Sciences Department at North Dakota State University will provide DON analyses on approximately 10,000+ wheat samples/year for about 16 to 20 scientists from central USA. The gas chromatography/mass spectrometry (GC/MS) method would be used for DON analysis. The Wheat Quality group has previous experience with the analysis method; 3) The Wheat Quality Laboratory is capable of analysis if DON derivatives upon request. The Wheat Quality Laboratories will have the analytical equipment after set up is complete. PI has previous experience and analytical skills to establish this laboratory and complete the task. The project is basic, providing the analytical support of DON concentrations in wheat varieties and experimental lines for USWBSI plant breeders /geneticists/pathologists management of FHB.