U.S. Wheat and Barley Scab Initiative
Annual Progress Report
September 18,2000

Cover Page

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Year:	**FY2000**
Grant Number:	**59-0790-0-067**
Grant Title:	**Fusarium Head Blight Research**
Amount Granted:	**$29,268.00**

Project

Program Area	Objective	Requested Amount
Food Safety, Toxicology and Utilization	Determination of DON and Scab in barley using Near-Infrared and Neural Network.	$114,686.00
	Requested Total	$114,686.00[1]

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Principal Investigator Date

[1] Note: The Requested Total and the Amount Granted are not equal.

Project 1: Determination of DON and Scab in barley using Near-Infrared and Neural Network.

1. What major problem or issue is being resolved and how are you resolving it?

FDA has established DON advisory levels in food and feed. Because of the near-zero tolerance of DON in barley imposed by the malting industry, measurement of DON of barley becomes especially important in quality control in this industry. DON is commonly measured using TLC (Thin Layer Chromatography), ELISA (Enzyme Linked Immunosorbant Assay), HPLC (High Performance Liquid Chromatography), GCMS (Gas Chromatography and Mass Spectroscopy), black light and minicolumn. These methods are either expensive, time-consuming, and require significant training, or are only suitable for qualitative and screening analysis. Scabbed barley kernels, especially lightly scabbed kernels, do not show apparent visual symptoms, and therefore are hard to pick compared with wheat kernels. The goal of this proposed project is to develop a rapid, simple, and economical method for DON measurement and scab estimation in barley. In the proposed research, inexpensive and easy-to-operate near-infrared (NIR) spectrometer will be used to acquire spectral data at many different wavelengths from large barley samples (instead of single kernel), and neural network technique (instead of statistics) will be used for calibration and determination.

2. Please provide a comparison of the actual accomplishments with the objectives established.

The objective of this project is to develop an economical, rapid, and nondestructive method for DON measurement and scab estimation for barley. The methodology is based on Near-infrared reflectance (NIR) spectroscopy and neural networks.

The project was just initiated. We are just getting personnel organized. The next step will be arranging analytical instruments and preparing samples.

3. What were the reasons established objectives were not met? If applicable.

Because project did not get set up until August, 2000.

4. What were the most significant accomplishments this past year?

N/A

Include below a list of the publications, presentations, peer-reviewed articles, and non-peer reviewed articles written about your work that resulted from all of the projects included in the grant. Please reference each item using an accepted journal format. If you need more space, continue the list on the next page.

None