

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

**Cover Page**

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<b>Year:</b>	<b>FY2000</b>
<b>Grant Number:</b>	<b>59-0790-9-035</b>
<b>Grant Title:</b>	<b>Fusarium Head Blight Research</b>
<b>Amount Granted:</b>	<b>\$89,500.00</b>

**Project**

<b>Program Area</b>	<b>Objective</b>	<b>Requested Amount</b>
Epidemiology	Develop a scab forecasting system by monitoring the environment and pathogens.	\$106,000.00
	<b>Requested Total</b>	\$106,000.00 <sup>1</sup>

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Principal Investigator

Date

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<sup>1</sup> Note: The Requested Total and the Amount Granted are not equal.

**Project 1: Develop a scab forecasting system by monitoring the environment and pathogens.**

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

Fusarium head blight is very difficult to manage with fungicides in part because optimal application timing is unknown. A disease forecasting system would benefit producers by providing timely information regarding the risk of infection. The task of developing an accurate forecast is complicated by the various production systems of wheat across North America, particularly the diversity found in corn belt vs. plains wheat areas. In order to develop a resilient prediction model, we need a comprehensive knowledge of the relationships among spore production, inoculation events, plant growth stage, and pertinent environmental factors. To resolve this issue as quickly as possible, multiple locations are conducting a common experiment designed to measure the impact of these parameters on disease development. Supplementary studies are being conducted at each location to address such issues as the effect of soil moisture on spore development, predisposing risk factors, and occurrence of airborne spores.

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

Cooperative relationships were established among researchers at Ohio State, Purdue, South Dakota State, North Dakota State, and Agriculture Canada-Manitoba. All participating locations in the collaboration successfully collected data according to a common protocol. As expected, fusarium head blight did not develop identically in all locations. At the present time, data are being collated by researchers at Ohio State University. Cooperators have agreed to conduct the experiment for at least one more field season.

In the North Dakota cooperative study, conditions were favorable for the development of fusarium head blight. Disease incidence ranged from 47% to 70% and severity was 22-31% in plots of susceptible Norm spring wheat that flowered at four different times.

To understand more about the aerobiology of fusarium head blight, air samples were collected with Burkard cyclone samplers positioned in fields with wheat stubble on the surface. Fusarium species were assayed in 76 samples collected between jointing and harvest at six Red River Valley locations. Eight species were found and *F. graminearum* was present in 70/76 samples. This result suggests that inoculum for head blight was produced throughout the crop season.

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

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

NDSU hosted an epidemiology workshop for Canadian and U.S. scientists working on FHB that led to better communications, experimental methods, and relationships among group members.

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.

De Wolf, E.D., Lipps, P.E., Franci, L.J., and Madden, L.V. 1999. Role of environment and inoculum level in wheat fusarium head blight development. Proceedings of the 1999 National Fusarium Head Blight Forum, Sioux Falls, SD.

Markell, S. and Franci, L.J. 1999. A comparative time line for dispersal, inoculum level, and environmental conditions in a moderate wheat head blight epidemic. Proceedings of the 1999 National Fusarium Head Blight Forum, Sioux Falls, SD.