

**U.S. Wheat and Barley Scab Initiative
 FY00 Final Performance Report (approx. May 00 – April 01)
 July 30, 2001**

Cover Page

PI:	Steven Leath
Institution:	College of Ag. And Life Sciences
Address:	100 Patterson Hall Box 7643 North Carolina State University Raleigh, NC 27695
Email:	steven_leath@ncsu.edu
Phone:	919-513-1946
Fax:	919-515-7745
Year:	FY2000 (approx. May 00 – April 01)
Grant Number:	
Grant Title:	Fusarium Head Blight Research
2000 ARS Award Amount:	\$29,268

Project

Program Area	Project Title	Requested Amount
Epidemiology & Disease Management	Variation in aggressiveness in Fusarium graminearum isolates from the southern U.S.	\$31,000.00
Chemical & Biological Control	Uniform fungicide trials to identify safe products that are effective against FHB.	\$5,000.00
	Requested Total	\$37,000.00¹

 Principal Investigator

 Date

¹ Note: The Requested Total and the Award Amount are not equal.

PI: Steven Leath

Grant:

Project 1: Variation in aggressiveness in *Fusarium graminearum* isolates from the southern U.S.

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

FHB is currently not a severe disease problem in North Carolina. Nevertheless, growers in the state have expressed concern over the potential for an increased problem with the disease due to the occurrence of severe outbreaks of the disease in the midwestern United States. If an adequate source of inoculum is present, changes in cultural practices such as a trend toward reduced tillage may create the potential for FHB epidemics in areas where the disease is currently not a problem. The adequacy depends on the volume of inoculum, which is increased under reduced tillage, and its capability to cause disease. The purpose of this study was to provide data on pathogen diversity within North Carolina with regard to factors such as isolate aggressiveness and toxin production, and to determine both the diversity of the pathogen population and its potential to cause severe disease in the state.

We are resolving this by collecting isolates of the pathogen and characterizing them for phenotype and genotypic varieties and assessing characteristics of aggressiveness.

2. What were the most significant accomplishments?

These data indicate a variable pathogen population of *F. graminearum* exists in North Carolina and members of this population can be both highly pathogenic on wheat and produce high levels of detrimental toxins indicating a potential threat for problems with FHB within the state.

Randomly Amplified Polymorphic DNA (RAPD) analysis revealed high levels of genotypic diversity among isolates. In vivo levels of DON were measured for the five isolates associated with the highest levels of disease and the five isolates associated with the lowest levels of disease, and no significant differences were found. However, all ten isolates produced detectable levels of DON in vivo.

PI: Steven Leath

Grant:

Project 2: Uniform fungicide trials to identify safe products that are effective against FHB.

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

Are fungicides available that will adequately and economically control Fusarium Head Blight of wheat in the southeastern United States? We attempted to resolve this with multi-year studies on fungicide efficacy.

2. What were the most significant accomplishments?

No single fungicide or application timing was fully adequate at controlling the disease. It has been shown in the short term fungicide application will not be satisfactory in curtailing the epidemics.

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.

Walker, S.L., Leath, S., Hagler, W. M., Murphy, J.P. Variation Among Isolates of *Fusarium graminearum* Associated with Fusarium Head Blight in North Carolina. *Plant Dis.* 85:404-410.

Walker, S.L., Leath, S., Hagler, W.M. and Murphy, J.P. Variation in isolates of *Fusarium graminearum* associated with wheat scab in North Carolina. *Phytopathology* 88:S93. 1988.

Walker, S.L., Leath, S., and Murphy, J.P. 1999. Evaluation of soft red winter wheat germplasm for resistance to scab. *Proc. Of the Joint Eastern Wheat Workers and Southern Small Grain Workers Conf., Williamsburg, VA.* 1999.

Walker, S.L., Leath, S., Hagler, W.M., and Murphy, J.P. 1999. Phenotypic variation in isolates of *Fusarium graminearum* associated with wheat scab in North Carolina. *Proc. Of the Joint Eastern Wheat Workers and Southern Small Grain Workers Conf., Williamsburg, VA.* 1999.