U.S. Wheat and Barley Scab Initiative
FY01 Final Performance Report (approx. May 01 – April 02)
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Cover Page

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Year:	**FY2001 (approx. May 01 – April 02)**
Grant Number:	**59-0790-1-069**
Grant Title:	**Fusarium Head Blight Research**
FY01 ARS Award Amount:	**$ 14,349**

Project

Program Area	Project Title	Requested Amount
Chem/Bio	Can We Debilitate the Wheat Scab Fungus With a Virus	$ 36,340
	Total Amount Requested	**$ 36,340**

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Principal Investigator Date

(Form – FPR01)

Project 1: Can We Debilitate the Wheat Scab Fungus With a Virus

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

This project is designed to develop a biological control agent based on mycovirus-conferred hypovirulent *Fusarium graminearum* strains. The initial problem is the identification of candidate mycoviruses. Current funding from the USW&BSI has been provided to underwrite the screening of fungal isolates for the presence of dsRNAs as indicators of viral infection. Almost three hundred isolates have been screened, with six identified as infected with mycoviruses. The next question concerning these viruses is whether they elicit hypovirulence of *F. graminearum* on wheat. The pathogenicity of the six new mycoviruses will be addressed in future assays.

Most importantly for this project, I have (through Dr. J. Leslie) been in touch with Dr. K.-H. Kim of Seoul National University. Dr. Kim and co-workers identified a virus-infected strain of *F. graminearum* that is hypovirulent on wheat (a copy of Dr. Kim's paper reporting these results accompanies the hard copy of this report). Dr. Kim's work demonstrates the feasibility of this project. He has generously supplied us with his virus-infected *F. graminearum* strains. In short, we now have mycoviruses that elicit hypovirulence of *F. graminearum* on wheat. The next problem is getting the virus into U.S. *F. graminearum* strains that can be tested in the greenhouse. The most efficacious means of transferring the Korean mycovirus to a U.S. fungal strain is molecular transformation of fungal nuclei. Cloning experiments are underway.

2. What were the most significant accomplishments?

This project started with the screening of *F. proliferatum* strains isolated from corn and sorghum. Four strains were infected with mycoviruses; three of the strains were shown infected with mitochondrial viruses. A manuscript reporting that *F proliferatum* is the fourth fungus known to carry mitochondrial viruses has been submitted to *Applied and Environmental Microbiology*.

Nearly three hundred *F graminearum* strains have been screened; six were identified as infected with mycoviruses. Determination of transmission patterns and further characterizations are underway. A manuscript reporting these mycoviruses is in preparation.

Hypovirulent *F. graminearum* strains are in hand.

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.

Heaton, L.A., and J.F. Leslie. 200_. Double-Stranded RNAs Associated with *Fusarium proliferatum* mitochondria. Submitted to Applied and Environmental Microbiology.

Heaton, L.A., and J.F. Leslie. 200_. Double-Stranded RNAs Associated with *Fusarium graminearum*. In preparation.