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

Cover Page

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Year:	**FY2000 (approx. May 00 – April 01)**
Grant Number:	
Grant Title:	**Fusarium Head Blight Research**
2000 ARS Award Amount:	**$24,390**

Project

Program Area	Project Title	Requested Amount
Epidemiology & Disease Management	Genetics of pathogenicity in Fusarium graminearum.	$44,000.00
	Requested Total	$44,000.00[1]

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Principal Investigator Date

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

Project 1: Genetics of pathogenicity in Fusarium graminearum.

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

The major problem addressed by this project was the level of genetic variation in the Fusarium head blight pathogen of wheat and barley with respect to its capability to cause disease on these crops. To address this issue, we tested for disease-causing ability in genetically distinct members of a world-wide collection of the fungal species *Fusarium graminearum* (teleomorph: *Gibberella zeae*) as well as for strains in the United States collected by the Cereal Disease Laboratory during its annual pathogen surveys. This knowledge will be useful to assure that screens of resistant plant varieties adequately account for the range of variation in the pathogen species.

2. What were the most significant accomplishments?

The major accomplishment of FY2000 has been to determine that the Fusarium head blight pathogen represents at least eight genetically distinct lineages. This finding indicates that the pathogen is genetically more diverse than previously recognized and may require greater effort on the part of FHB workers to account for this diversity. The other major accomplishment has been to determine that strains of the pathogen vary greatly in their ability to spread within susceptible wheat varieties and this may lead to clues on how to prevent the dissemination of disease.

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.

Articles written about this work.

Kurtzman, C.P. 2000. Microbial Genomes: Unraveling Their Potential. Agricultural Research 48 (8): 2.

Hardin, B. 2000. DNA Profiling: Guarding Against a Plant Disease Epidemic. Agricultural Research 48 (8):4 – 7 (cover story).

Publications:

O'Donnell, K., H.C. Kistler, B.K. Tacke, and H.H. Casper. 2000. Gene genealogies reveal global phylogeographic structure and reproductive isolation among lineages of *Fusarium graminearum*, the fungus causing wheat scab. Proc. Natl. Acad. Sci. USA 97:7905-7910.
(The support of the U.S. Wheat and Barley Scab Initiative was acknowledged in this paper).