U.S. Wheat and Barley Scab Initiative
Annual Progress Report
September 15, 1999

Cover Page

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Year:	**FY1999**
Grant Number:	**59-0790-9-057**
Grant Title:	**Fusarium Head Blight Research**
Amount Granted:	**$68,293.00**

Project

Program Area	Objective	Requested Amount
Variety Development	Accelerate development of resistant varieties.	$70,000
	Requested Total	$70,000[1]

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Principle Investigator Date

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

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Project 1: Accelerate development of resistant varieties.

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

Fusarium head blight (FHB) caused by the fungus *Fusarium graminearum* Schwabe has caused significant production and grain quality losses in wheat in Indiana and the midwest states of the USA in several of the last 10 years. The increased incidence and severity of the disease has been due to reduced soil tillage practices for soil conservation together with favorable weather patterns for development of the disease on wheat. Although the disease was not widespread in Indiana in 1999, there were areas of Indiana in which losses due to FHB were as high as 25 % in some fields.
Based on what is known about the epidemiology of the disease to date, commercialization of resistant wheat cultivars is one of the most practical and economical means of minimizing losses due to the disease. Thus, development of soft red winter wheat cultivars adapted to Indiana and surrounding regions and that have resistance to FHB is the primary focus of the wheat breeding research program at Purdue University.

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

Objective 1: develop FHB resistant and low FHB incidence wheat cultivars that are adapted throughout Indiana. The cultivar, INW9824, with one gene that conditions type 2 resistance (reduces the rate of disease development after infection) from donor parent, Ning 7840, was released. Cultivar, Goldfield, on which the incidence of FHB infection is typically 1/4 that of other cultivars, like cv. Patterson, was released. Populations and lines are in the breeding program that have more than one gene for type 2 resistance and that have type 2 resistance combined with low FHB incidence, like the low FHB incidence of Goldfield.
Objective 2: determine allelism/linkage of FHB resistance genes of several wheat resistance source lines. Segregating populations from crosses between several FHB resistance source lines have and are being characterized for FHB resistance. FHB resistant source lines include three single-resistance-gene lines each with one of the 3 resistance genes of Ning 7840, and Mironovskaya 808, Bizel, Freedom, Ernie, Patton, 201R, Huapei 32-2 and Huapei 57-2. Populations will be characterized in repeated testing for reliability of segregation analysis.
Objective 3: determine inheritance of FHB low incidence. A recombinant inbred population from a cross of Goldfield x Patterson is being developed and is in the F5 generation. The population of F7-derived lines will be evaluated in replicated tests in the field and greenhouse.

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

Research progress is on schedule.

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

Crosses were carried out to combine several sources of FHB resistance. A nursery was established in Argentina to accelerate generation advance of breeding populations. Selection was carried out in nurseries at several locations throughout Indiana to generate reliable selection on an accelerated basis.

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.