

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

**Cover Page**

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<b>Year:</b>	<b>FY1999</b>
<b>Grant Number:</b>	<b>59-0790-9-054</b>
<b>Grant Title:</b>	<b>Fusarium Head Blight Research</b>
<b>Amount Granted:</b>	<b>\$39,024.00</b>

**Project**

<b>Program Area</b>	<b>Objective</b>	<b>Requested Amount</b>
Chemical & Biological Control	Identify safe, effective fungicides for FHB through evaluation across of wheat and/or barley varieties grown in relevant environments.	\$4,000
Chemical & Biological Control	Develop and implement systems for disseminating research information in a timely fashion to producers.	\$1,000
Variety Development	To enhance variety development of scab resistant varieties.	\$35,000
	<b>Requested Total</b>	<b>\$40,000<sup>1</sup></b>

\_\_\_\_\_  
Principle Investigator

\_\_\_\_\_  
Date

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

**Project 1: Identify safe, effective fungicides for FHB through evaluation across of wheat and/or barley varieties grown in relevant environments.**

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

The major issue is to identify fungicides that are effective against FHB. I tested the ten treatments in the uniform FHB fungicide test coordinated by Marcia McMullen under inoculated and misted conditions at Fayetteville, AR. I also negotiated with a chemical company to test an experimental compound under a secrecy agreement as an addition to the treatments in the uniform test. Based on past results, FHB evaluations can be done at Fayetteville in the absence of other diseases, and this is a distinct advantage over testing where foliar diseases confound the interpretations of results.

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

Treatments were applied on schedule and an adequate level of FHB developed in the field plot. No other diseases were present in the experiment at levels that would have affected the results. In general, all fungicides in the uniform test significantly reduced mean FHB severity and FHB index compared to the nontreated check, but there were no significant differences among the fungicides, and the level of control was not great enough to be economically feasible for growers. There were no significant differences for yield, test weight, FHB incidence, or DON level in the grain. A full report of the results has been provided to Marcia McMullen, and the results have been prepared for publication in Fungicide and Nematicide Tests.

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

Lodging occurred in the experiment and likely confounded the yield data ( $CV = 22.2\%$ ). If no lodging had occurred there may have been some significant differences among the treatments.

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

Further verification that the fungicides and/or the applications methods used in the uniform test do not adequately control FHB under moderate disease pressure. Future work should concentrate on improving the application techniques to deliver more fungicide to the heads and on discovering more effective fungicides.

**Project 2: Develop and implement systems for disseminating research information in a timely fashion to producers.**

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

The major issue is to disseminate useful information to growers for managing FHB. At this point there has been no new information generated that could be utilized by growers in Arkansas. The plan for disseminating useful information is to utilize the Extension Service, field days, grower meetings, and a web site.

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

As stated above, there is nothing to disseminate at this point. The Arkansas Wheat Growers Association and the Arkansas Wheat Promotion Board are aware and supportive of the national effort to manage FHB.

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

Need some new, useful information applicable to Arkansas.

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

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Made the Arkansas Wheat Growers Association and the Arkansas Wheat Promotion Board aware of the national effort to manage FHB.

**Project 3: To enhance variety development of scab resistant varieties.**

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

The major issue is to develop agronomically suitable soft red winter wheat varieties adapted to the Midsouth. The approach has been to accelerate a germplasm enhancement project for FHB resistance that has been funded by the Arkansas Wheat Promotion Board since 1996 and to encourage a wheat breeder to become involved with the project.

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

Seventy-seven selected bulk populations derived from crosses between adapted varieties and various sources of FHB resistance were evaluated for FHB resistance, plant type, and maturity in an inoculated and irrigated screening nursery. Two hundred heads from the best plants in each population were harvested and threshed individually. Seeds were evaluated for scab, plumpness, sprouting, and black point, and seeds from the best 120 heads will be planted in a screening nursery this fall for further evaluation. These same 77 bulk populations also were evaluated for adaptation to conditions of heavy clay soil in northeast Arkansas, and all grew well.

The Cooperative Soft Red Winter Wheat FHB nursery was evaluated for resistance in replicated 3-row plots in an inoculated, irrigated screening nursery. Adequate levels of FHB developed in the nursery, and there were significant differences among the entries for FHB severity, incidence and index. A full report was sent to the coordinator of the nursery in a timely manner.

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

The only shortcoming of the results reported above is that some of the entries in the Cooperative Nursery headed 2 weeks later than entries with "normal" maturities, and these late-maturing entries likely appeared to be more resistant than they actually are.

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

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Populations derived from crosses between adapted cultivars and various sources of FHB resistance appeared to be well adapted and have a high proportion of resistant plants. Prospects appear to be good for identifying resistant lines with good agronomic traits.

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.

Prom, L., Milus, E.A., Bacon, R., and Weight, C. Developing options for managing scab in the Midsouth. Presentation at the annual meeting of the Midsouth Association of Wheat Scientists, Memphis, TN, August 1999.

Prom, L., Milus, E.A., and Weight, C. Efficacy of fungicides for control of Fusarium head blight of wheat in Arkansas, 1999. (Prepared for publication in Fungicide and Nematicide Tests)