

**U.S. Wheat and Barley Scab Initiative
Annual Progress Report
September 18, 2000**

Cover Page

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Year:	FY2000
Grant Number:	59-0790-9-061
Grant Title:	Fusarium Head Blight Research
Amount Granted:	\$75,000.00

Project

Program Area	Objective	Requested Amount
Variety Development & Uniform Nurseries	Accelerate development of resistant barley varieties.	\$69,463.00
	Requested Total	\$69,463.00¹

Principal Investigator

Date

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

Project 1: Accelerate development of resistant barley varieties.

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

The major problem is developing genetic resistance to FHB in barley varieties adapted to the Midwest that are acceptable in agronomics and quality. We are approaching this problem by enhancing our understanding of disease resistance to FHB, developing technologies for screening and selecting FHB resistant lines and breeding FHB resistant varieties.

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

Three "Expected Results" were outlined in the proposal.

- i. *clarify the relationship between "type I" and "type III" resistance in barley and characterize a diverse set of "type I" resistant germplasm for "type III" resistance;*

We have evaluated a mapping population derived from a cross between an unadapted two-rowed variety with partial resistance to FHB (Frederickson) and a Midwest variety (Stander) in a greenhouse assay to quantify the accumulation of deoxynivalenol (DON) in kernels which have been injected with *Fusarium graminearum*. We observed segregation for this trait in the population and a preliminary analysis has identified several genetic markers linked to the trait. In the remainder of the funding period, we intend to repeat this experiment, complete the genetic analysis, and screen a diverse set of other FHB resistant sources for accumulation of DON.

- ii. *test the utility of early generation selection for FHB resistance;*

In the Summer of 1999, we selected F₂ plants, from each of four crosses, that appeared resistant to FHB and an equal number of randomly selected plants. This summer (2000), we evaluated F_{4,5} lines derived from those F₂ plants for resistance to FHB. Preliminary analysis indicates that little or no gain from selection was made from early generation selection in these crosses.

- iii. *identify resistant barley lines that can be used as parents in second or third cycle crosses and identify resistant barley lines with good agronomic and malting quality characteristics that can be more rigorously evaluated as variety candidates*

We identified 60 new lines that were resistant in 2000 FHB screening nurseries that will be considered as new parents for crossing this fall. These lines trace back to 8 different parental sources of resistance other than Chevron. We have identified several elite lines with acceptable yield and agronomics and improved FHB resistance that will undergo malt quality evaluation this fall as well as consideration for designation as variety candidates.

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

Not applicable.

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

We obtained good quality disease data from two of three disease screening nurseries (3 locations) that enabled us to identify lines with resistance better than MNBrite, currently the only variety with partial resistance to FHB.

Year: 2000

Progress Report

PI: Kevin P. Smith

Grant:

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 during this funding period to date.