

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

Cover Page

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Year:	FY1999
Grant Number:	59-0790-9-062
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	\$70,000¹

Principle Investigator

Date

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

Project 1: Accelerate development of resistant varieties.

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

Wheat producers will not grow resistant varieties unless the agronomic performance is at least as good as what is currently being grown. Breeding for scab resistance has to be an integral part of the breeding program. Mist-irrigated greenhouse and field screening nurseries have been established. Breeding materials are evaluated for scab resistance using three generations per year: two generations in the greenhouse and one generation in the field. We have the capacity to screen 4000 individual hills in each greenhouse season. We now have 3 acres in the field under mist-irrigation. Both the field and greenhouse nurseries are inoculated with infected grain (corn and wheat) and conidial suspensions, and mist-irrigation is used to provide a favorable environment for infection. Approximately one third of the breeding populations trace back to Sumai 3 as a source of resistance, one third are from other identified sources of resistance, and one third are from crosses with various "field tolerant" advanced breeding lines. The approach is to steadily recombine different resistance sources and to simultaneously select for resistance and desirable agronomic characteristics.

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

The objective of the project is "to accelerate the development of scab resistant spring wheat varieties for South Dakota." This objective is being met. Greenhouses and off-season nurseries are being used to accelerate the breeding effort. Through greenhouse and field nurseries, three generations per year are being screened for scab resistance. We increased the number of entries in our field scab-screening nursery from 1,000 to 3,000. The number of rows in our off-season nurseries increased from 2,500 to 5,000.

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

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

- Two lines with scab resistance from Sumai 3 were increased during the winter. One of the lines (SD3407) was increased this summer and we have approximately 3,000 bushels of seed available for potential release in 2000.
- Of the thirty entries in our 1999 Advanced Yield Trial, all but 4 had scab resistance ratings better than '2375' and 6 were similar in resistance to Sumai 3. All yielded equal to or better than 2375.

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Progress Report

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.