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

Cover Page

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Year:	**FY1999**
Grant Number:	**59-0790-9-028**
Grant Title:	**Fusarium Head Blight Research**
Amount Granted:	**$34,146.00**[1]

Project

Program Area	Objective	Requested Amount
Variety Development	Accelerate development of resistant varieties.	$35,000
	Requested Total	$35,000

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Principle Investigator Date

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

Year: 1999 Progress Report
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Grant: 59-0790-9-028

Project 1: Accelerate development of resistant varieties.

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

We are attempting to develop hard white spring wheat varieties for the region with scab resistance. To do this, we are hybridizing North Dakota adapted red spring wheat lines and *Triticum dicoccoides* germplasm with scab resistance to adapted white wheat lines.

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

Funds for this research project were distributed to us in June 1999. Our original goal was to hybridize adapted white wheat lines with adapted red wheat lines containing the 'Sumai 3' source of scab resistance and to incorporate a *Triticum dicoccoides* source of resistance into the white wheat lines. Additionally, the resultant hybrids were to be backcrossed several times to the adapted white wheat lines, from which homozygous resistant lines were to be selected. We proposed using molecular markers for scab resistance to make this selection process more efficient.

Several of our best performing advanced white wheat lines have been hybridized with adapted red wheat lines with scab resistance. The F1's will be backcrossed in the greenhouse this season, and we will attempt to advance the material more rapidly through the breeding program by attempting to produce doubled-haploid plants using a maize x wheat technique. Original white wheat lines are to be greenhouse screened for scab resistance this fall to detect any possible source of scab resistance in the initial pedigrees. A post-doctorate has been hired to do the greenhouse screening and identify molecular markers to be used in the eventual screening of the backcross produced or double-haploid produced lines. We expect to use synthetic hexaploid wheat with the Triticum dicoccoides source of resistance as a "bridge" to enable the transfer of scab resistance to the hexaploid white wheat lines.

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

All of the objectives have not been met because it will take several years to develop the backcross and/or double-haploid lines for scab screening. However, we have accomplished the initial hybridization phase of the project and hired an individual to screen for scab resistance and identify molecular markers.

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

Hybridizing our advanced hard white spring wheat lines with scab resistant red wheat lines and establishing the double-haploid program to quickly advance them through the breeding program was a significant accomplishment. The hiring of a post-doctorate with excellent experience in molecular genetics and in screening for scab resistance was also significant. Degenerate oligonucleotide primers to cloned plant resistance genes have been used to detect polymorphisms for the 'Sumai 3' and *Trititicum dicoccoides* source of scab resistance, and these have proven to be promising. We are in the process of developing linkage relationships to see if these primers could eventually help in selecting for resistance.

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.

No publications or presentations have been made to date. However, we hope to publish and present the results of the scab screening of our backcross and/or double-haploid produced white wheat lines at future scab symposia.