U.S. Wheat & Barley
Scab Initiative

U.S. Wheat and Barley Scab Initiative
FY01 Final Performance Report (approx. May 01 – April 02)
July 15, 2002

Cover Page

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Year:	**FY2001 (approx. May 01 – April 02)**
Grant Number:	**59-0790-1-077**
Grant Title:	**Fusarium Head Blight Research**
FY01 ARS Award Amount:	**$ 19,469**

Project

Program Area	Project Title	Requested Amount
Chem/Bio	Evaluation of varietal responses to different fungicide management strategies in spring wheat	$ 50,000
	Total Amount Requested	**$ 50,000**

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Principal Investigator Date

(Form – FPR01)

Project 1: Evaluation of varietal responses to different fungicide management strategies in spring wheat

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

Cultivars of hard red spring wheat differ genetically in their response to one or more of the economic important fungal pathogens. Broad spectrum, systemic fungicides like tebuconazole or propiconazole, can provide excellent control of the residue born, foliar as well as provide suppression of fusarium head blight. The tools available to assist HRSW producers in Minnesota and North Dakota to make fungicide decisions include a decision support system and a spore sampling network and disease forecasting system that predicts the likelihood of an infection of the economic important foliar pathogens and quantifies the presence of Fusarium graminearum spores. These decision aids do not take into account the genetic differences in resistance to one or more of the economic important diseases. Previous research has shown that significant cultivar by fungicide interactions exist. The objectives of this research are to: 1) Evaluate whether cultivars can be grouped in classes such that fungicide management decisions can be made to optimize economic returns of the application of one and 2) Evaluate which fungicide management strategy is most economic given a cultivars' characteristics.

The experiment using a factorial design with the first factor the grouping of cultivars and as the second factor, the different fungicide management strategies was conducted in 2001 and will be repeated in 2002. The grouping of cultivars is as follows: Susceptible to both foliar diseases and FHB, Susceptible to FHB but resistant to foliar diseases, Susceptible to foliar diseases but resistant to FHB, and Resistant to both FHB and foliar diseases. The fungicide management approaches used are: No fungicides applied, One application at Feekes 5, One application at Feekes 10.51, One application at Feekes 5 and one at Feekes 10.51, and one or two applications based on the available decision support systems. The fungicides were applied at recommended rates and volumes using a backpack sprayer. Variables measured included disease ratings for foliar diseases and FHB at 21 days after heading, grain yield, test weight, and grain protein. Economic returns were calculated using figures based upon Minnesota Farm Business Management Education's cost estimates.

2. What were the most significant accomplishments?

In 2001, the experiment was planted on May 18 and initial growth and development were excellent. The growing season started cool and dry. Some light pressure of tan spot was evident early. An early application at Feekes 5.0 was made with a half of the labeled rate of 'Stratego' on June 14th for both fungicide treatments 4 and 5. Quickly thereafter, temperatures soared in the high eighties and low nineties by the end of the month of June, pushing the development of crop along fast. The application of 'Folicur' at Feekes 8 was made on June 29th. Conditions for disease development were rated unfavorable for the leaf diseases and few or no FHB spores were detected by the closest sampling point of the disease forecasting system throughout the later part of June and the first two weeks of July. A final application of 'Folicur' at 4 fl oz. at Feekes 10.5.1 was made on July 7th.

Initial results indicate that the grouping of cultivars worked as the groups sorted out as expected based on their disease ratings. The fungicide treatments showed significant differences for average severity observed at Feekes 11.0, with treatment 4 showing the least amount of leaf diseases. Initially, the disease pressure for the leaf disease was very light but an outbreak of the leaf diseases occurred after Feekes 10.5.1. This late outbreak was favored by frequent rain events and high relative humidity in the later part of July as indicated by the disease forecasting system. No significant differences were found for field severity of FHB, as the overall disease pressure of FHB was light with field severities not exceeding 10%.

No fungicide x cultivar group interaction was detected for any of the traits analyzed.

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.

With only a single year's data collected and analyzed it is premature to publish any results. Consequently no publications or presentations have been written or held at this time.