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

Cover Page

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Year:	**FY2000**
Grant Number:	
Grant Title:	**Fusarium Head Blight Research**
Amount Granted:	**$10,000.00**

Project

Program Area	Objective	Requested Amount
Chemical & Biological Control	Evaluate best biocontrol strains on durum wheat in field trials conducted at sites highly or moderately conducive to FHB.	$88,300.00
	Requested Total	$88,300.00[1]

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Principal Investigator Date

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

Project 1: Evaluate best biocontrol strains on durum wheat in field trials conducted at sites highly or moderately conducive to FHB.

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

Fusarium head blight (FHB) of wheat and barley is a devastating disease capable of reducing yield by 20-40% and more when warm moist conditions exist during the time of flowering and early grain fill. Mycotoxin contamination of grain usually accompanies disease outbreaks. Control measures available for combating this disease are limited. Greenhouse and field experiments funded, in part, by the U.S. Wheat & Barley Scab Initiative have demonstrated that 7 biocontrol agents that we had previously discovered were effective in reducing FHB on winter and spring wheats. Experiments were conducted, in work outside the scope of this present investigation, to improve antagonist efficacy and reliability in controlling FHB via management of fermentation protocols. Prior to our investigations, little work had been conducted on biologically controlling FHB on durum wheats. The objective of the presently funded research was to test biocontrol inoculum that had been improved via management of the liquid culture fermentation environment, on two durum wheat cultivars in field trials conducted in Peoria, Illinois and Langdon, ND.

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

Field testing of six antagonists on two durum cultivars (Ben and Renville) at Peoria, IL and Langdon, ND was conducted as per established objectives. Disease severity and incidence data collection is complete. Yield data (100 kernel weight) is being collected and analysis of grain DON content is anticipated. In experiments conducted beyond the stated objectives, biomass of the six microbial antagonists was produced in two fermentation media that differed in carbon to nitrogen ratio (6.5 vs 11) but not total carbon loading, and field tested in Peoria, IL.

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

Not applicable.

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

Biological control of FHB on two different cultivars of durum wheat was demonstrated at both Peoria, IL and Langdon, ND. Additionally, antagonist biomass produced in C:N 6.5 medium was approximately 18% more effective in reducing FHB than was inoculum produced in the C:N 11 medium when data was pooled across both cultivars in the Peoria experiment. At Peoria on cultivar Renville, all six antagonists reduced percent disease severity, percent disease incidence and increased 100 kernel weight when produced in one or both C:N media compared to the buffer control. On cultivar Ben, 3 out of 6 antagonists significantly decreased percent disease severity and increased 100 kernel weight when produced in one or both C:N media.. Low viable cell counts adversely affected results in

Langdon, ND where only 2 of the 6 antagonists significantly reduced FHB severity on cultivars Renville and Ben.

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.

SCHISLER, D.A., KHAN, N.I.,and BOEHM, M.J. 2000. Greenhouse and field testing of antagonists of Fusarium head blight on durum wheat. Phytopathology 90:S69.

SCHISLER, D.A, KHAN, N.I., BOEHM, M.J, SLININGER, P.J., and BOTHAST, R.J. 1999. USDA-ARS, Ohio State University Cooperative research on Biologically controlling Fusarium head blight:1. Antagonist selection and testing on durum wheat. Proceedings of the 1999 National Fusarium Head Blight Forum, Sioux Falls, SD.