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

Cover Page

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Year:	**FY1999**
Grant Number:	**59-0790-9-068**
Grant Title:	**Fusarium Head Blight Research**
Amount Granted:	**$4,878.00**

Project

Program Area	Objective	Requested Amount
Chemical & Biological Control	Identify safe, effective fungicides for FHB through evaluation across of wheat and/or barley varieties grown in relevant environments.	$4,000
Chemical & Biological Control	Develop and implement systems for disseminating research information in a timely fashion to producers.	$1,000
	Requested Total	$5,000[1]

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Principle Investigator Date

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

Project 1: Identify safe, effective fungicides for FHB through evaluation across of wheat and/or barley varieties grown in relevant environments.

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

   Develop a means to control fusarium head blight in wheat with the application of a fungicide, fungicides, or biological agent on wheat heads prior or during anthesis.

   In October, 1998 a soft red winter wheat cultivar was seeded no-tillage into chopped corn residues remaining after harvest of a grain corn crop in September, 1998 in Richmond County, Virginia. Eleven treatments were anticipated with four replications. Individual plot units were six 7-inch spaced rows wide by 25 feet long. On 27 April a weather station (measuring ambient temperature, relative humidity, solar radiation, rainfall, barometric pressure, wind speed and direction) was established within the test plot area. At this time sterilized corn seed inoculated with *Fusarium graminearum* was liberally distributed within each experimental unit (500 g / plot unit) to "spike up" the inoculum potential.

   In October, 1999 a soft red winter wheat cultivar will be seeded no-tillage into chopped corn residues as in 1998. This will provide the experimental area for the 2000 season.

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

   Ten fungicide treatments and a non-treated control were made to evaluate the efficacy of fungicide(s) or a biological agent, *Fusarium oxysporum*, provided by Dr. Deborah Fravel, USDA, ARS Biocontrol of Plant Diseases Laboratory, Beltsville, MD. Treatments were made at either Zadoks' Growth Stage 54 or 61 and applied with a CO_2-pressured backpack sprayer delivering 500 ml per plot unit at 60 psi for the fungicides and 20 psi for the biological agent.

   Wheat heads were scored for incidence of fusarium head blight and severity of blight on each head. One hundred heads were selected randomly. The number of heads with one or more blighted florets would have been recorded and the percentage of head that was affected would be recorded.

   Unfortunately the mid-Atlantic and Northeastern US suffered from a major drought beginning at the end of April until September (with hurricane activity bring much needed rain). At the plot location only 0.03 inches of rain was received from 1 May to 15 June. This lack of precipitation did not provide conducive conditions fusarium head blight development.

   On 24 June the plots were harvested with an Hege Plot Combine. The grain yield is reported in bushels per acre and kilograms per hectare at a standard moisture content of 13.5%. The moisture of the grain at harvest was also recorded. Sub-samples of the

harvested grain were taken back to the PI's seed laboratory for 1000 kernel weight and bushel weight determinations. From these sub-samples samples were sent to Dr. Pat Hart at Michigan State University for DON determination. At this time the results of the DON determinations have not been received.

Grain yields for all treatments were not statistically different from the non-treated control and no fusarium head blight was detected in any of the treatments or plots. There were some statistical differences in 1000 kernel weights among treatments. No other diseases (powdery mildew, tan spot, stagonospora leaf and glume blotch or leaf rust) were detected within the plots. This too was undoubtedly due to the extremely dry conditions. No phytoxicity was observed from any treatment and no apparent affect was observed on heads treated with the *Fusarium oxysporum* - preparation.

Treatment and rate in product/A	Application Growth Stage	24Jun HARV. Moisture in $\%H_2O$	24 Jun YIELD BU/A at 13.5%	24 Jun YIELD Kg/Ha at 13.5%	1000 kernel weight in g	Bushel weight in lbs
NON-TREATED		13.3 ab*	68.1 a	4587.4 a	34.4 ab	58.9 a
FOLICUR 3.6F 4.0 fl. oz	61	13.3 ab	71.5 a	4822.6 a	35.7 a	58.8 ab
+ INDUCE L 0.6 % v/v						
BENLATE 50W 8.0 oz	61	12.9 b	67.8 a	4564.4 a	32.8 b	58.4 b
+ MANZATE 200 75DF 2 lbs						
+ LATRON CS-7 0.12% v/v						
PENNCOZEB 75DF 1 lb	54	13.1 ab	67.9 a	4574.0 a	34.0 ab	57.9 c
fb PENNCOZEB 75DF 1 lb	61					
BAS 500 00F 2.09EC 15.6 fl. oz	54	13.1 ab	68.3 a	4602.0 a	34.5 ab	58.5 ab
+ COC 1% v/v						
BAS 500 00F 2.09EC 15.6 fl. oz	61	13.3 ab	68.7 a	4626.3 a	34.1 ab	58.8 ab
+ COC 1% v/v						
STRATEGO 2.1EC 10.0 fl. oz	61	13.4 ab	69.7 a	4696.0 a	34.1 ab	58.4 b
STRATEGO 2.1EC 14.0 fl. oz	61	13.4 ab	67.9 a	4546.3 a	36.0 a	58.6 ab
QUADRIS 2.08SC 12.3 fl. oz	57	13.8 ab	66.7 a	4491.0 a	35.2 ab	58.9 ab
QUADRIS 2.08SC 9.2 fl. oz	57	13.9 a	66.9 a	4506.3 a	35.2 ab	58.8 ab
USDA-ARS Biocontrol Laboratory	54	12.9 ab	66.7 a	4495.7 a	34.9 ab	58.4 ab
Fusarium oxysporum preparation						
10^6 conidia per ml at 5 ml/sq. ft.						
USDA-ARS Biocontrol Laboratory	61	13.1 ab	67.8 a	4569.6 a	33.6 ab	58.7 ab
Fusarium oxysporum preparation						
10^6 conidia per ml at 5 ml/sq. ft.						
Least Significant Difference ($P \leq 0.05$)	=	0.89	6.36	428.35	2.12	0.42
Standard Deviation	=	0.62	4.41	296.66	1.47	0.29
Coefficient of Variation	=	4.63	6.47	6.46	4.26	0.50

*Means with letter in common do not differ significantly ($P \leq 0.05$) by Duncan's MRT.

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

   The unusually dry conditions that prevailed during the period just prior to heading and continuing through grain harvest were not at all conducive to fusarium head blight. As a result no fusarium head blight was detected in any plot. This was despite the planting of plots no-tillage into chopped corn stubble and "over seeding" the plot are with sterilized corn seed inoculated with *Fusarium graminearum*.

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

   All planned work was completed. Plots were managed well. All treatments were made on time without any errors.

Project 2: Develop and implement systems for disseminating research information in a timely fashion to producers.

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

   We have developed a website for information on small grains disease control. This site can be accessed at

   http://www.ppws.vt.edu/stromberg/smallgrain/sgrain.html

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

   The Small Grains Web site is used as the primary means of distributing information to county agents within Virginia, small grains growers in Virginia, the Agri-business community, and others on the biology, description, cultural and chemical means of control of small grain diseases. In the last 12 months this site has received over 80,000 hits.

   By way of comparison I take part in some 10 grower meetings across Virginia to present small grains disease control information. At each of these meeting I may have the "ear" of 40 to 100 individuals. Although this is not a bad audience the 80,000 hits received on the website dwarfs this direct presentation effort.

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

   Information on the effectiveness of fungicide treatments on the control of fusarium head blight could not be disseminated because there was no head blight disease to determine efficacy.

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

   The Virginia grower and Extension Service acceptance of a web-based small grains disease information system.

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.

Since the funding was only received on 30 May 1999 and the work just completed in July there has been little time to prepare any publications, particularly in light of the lack of fusarium head blight disease pressure.

I anticipate the a publication in Volume 55 of Fungicide and Nematicide Tests will be prepared this November on the trials conducted in Richmond County, Virginia.