

**USDA-ARS/
U.S. Wheat and Barley Scab Initiative
FY13 Final Performance Report
July 15, 2014**

Cover Page

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Fiscal Year:	FY13
USDA-ARS Agreement ID:	59-0206-9-064
USDA-ARS Agreement Title:	Studies on Management Strategies and Environmental Factors Affecting FHB and DON in Multiple Grain Classes, ND.
FY13 USDA-ARS Award Amount:	\$ 44,764

USWBSI Individual Project(s)

USWBSI Research Category*	Project Title	ARS Award Amount
MGMT	Integrated Management Coordinated Project, ND.	\$ 35,735
MGMT	Uniform Fungicide Trials in ND.	\$ 9,029
	FY13 Total ARS Award Amount	\$ 44,764

Principal Investigator

Date

* MGMT – FHB Management
 FSTU – Food Safety, Toxicology, & Utilization of Mycotoxin-contaminated Grain
 GDER – Gene Discovery & Engineering Resistance
 PBG – Pathogen Biology & Genetics
 BAR-CP – Barley Coordinated Project
 DUR-CP – Durum Coordinated Project
 HWW-CP – Hard Winter Wheat Coordinated Project
 VDHR – Variety Development & Uniform Nurseries – Sub categories are below:
 SPR – Spring Wheat Region
 NWW – Northern Soft Winter Wheat Region
 SWW – Southern Soft Red Winter Wheat Region

Project 1: *Integrated Management Coordinated Project, ND.*

1. What major problem or issue is being resolved relevant to Fusarium head blight (scab) and how are you resolving it?

Management of FHB in small grains is best achieved when using an integrated approach. Specifically, less susceptible varieties and timely fungicide applications offer the greatest suppression of FHB and DON levels. In an effort to obtain a continuance of data on this topic, North Dakota participated in several integrated trials where host resistance and fungicide applications were used. Hard red spring wheat and hard red winter wheat fungicide by variety trials were established at several locations across the state. Most of the locations experienced moderate FHB epidemics. Results were reported to Pierce Paul (Ohio State University) and at several Extension oriented winter meetings.

The trials produced information that strengthened the decisions made by growers for managing FHB and DON. Showing the value of host resistance and fungicide applications allowed growers to gauge the importance of these two tools in FHB management and allowed a better understanding of FHB prediction models.

2. List the most important accomplishments and their impact (i.e. how are they being used) to minimize the threat of Fusarium Head Blight or to reduce mycotoxins. Complete both sections; repeat sections for each major accomplishment:

Accomplishment:

The trials indicated that using multiple management tools (varietal resistance and fungicides) offered the greatest suppression of scab. DON levels were consistently lower when fungicides were applied on winter wheat and hard red spring wheat varieties. For both winter wheat and hard red spring wheat, differences in scab susceptibility were seen across varieties.

Impact:

The variety by fungicide trials provided the necessary information to reaffirm recommendations for growers and consultants across the state. Showing the varying degrees of scab susceptibility in varieties allows growers to choose a variety that meets all of their needs. By employing a combination of scab management tools, growers will be able to increase yields and quality in their fields.

Project 2: *Uniform Fungicide Trials in ND.*

1. What major problem or issue is being resolved relevant to Fusarium head blight (scab) and how are you resolving it?

Timely use of appropriate fungicides is an important management tool for FHB. Updating and expanding information on the efficacy of fungicides allows growers to extrapolate necessary information for their production system. In 2013, fungicide uniform trials were established on hard red spring wheat at two locations in ND (Carrington Research Extension Center and Fargo). Hot and dry weather conditions during flowering were not conducive for scab development at the Fargo location. Therefore, no scab index ratings were recorded at this site. At the Carrington site, scab incidence and severity ratings were recorded, however no statistical significance was found between treatments. Numerically, most of the fungicides used resulted in lower scab severity compared to the non-treated control. Data from both locations was provided for the Uniform Fungicide Trial Report.

2. List the most important accomplishments and their impact (i.e. how are they being used) to minimize the threat of Fusarium Head Blight or to reduce mycotoxins. Complete both sections; repeat sections for each major accomplishment:

Accomplishment:

The trials continue to demonstrate that triazoles-based fungicides are the most effective in suppressing FHB and DON. Although conditions did not provide a high level of scab in the state, the trials still indicated that an application of a triazole fungicide at early flowering had lower scab severities compared to the non-treated control. Additionally, the trial at Carrington showed that a post-anthesis application with a triazole fungicide can still offer scab suppression.

Impact:

The information obtained reinforces fungicide recommendations for scab management. Although best used in combination with less susceptible varieties, fungicides are an important in-season management tool in moderate to high scab risk areas. The importance of a triazole application at anthesis has educated growers on fungicide timing and fungicide choice in small grains.

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 FY13 grant. Please reference each item using an accepted journal format. If you need more space, continue the list on the next page.

Presentations

Friskop, A. Latest on Fungicides and Diseases in Wheat. Best of the Best Wheat Show. Williston, ND.

Friskop, A. Latest on Fungicides and Diseases in Wheat. Best of the Best Wheat Show. Hettinger, ND.

Friskop, A. Small Grains After What? Diversity, Direction, and Dollars. Dickinson, ND.

Publications

Paul, P., Bergstrom, G., Bradley, C., Byamukama, E., Cummings, J., Dill-Macky, R., Friskop, A., Grybauskas, A., Madden, L., Milus, E., Ransom, J., Ruden, K., Salgado, J., Smith, M., Sweets, L., Wegulo, S., and Wise, K. Report: 2013 Uniform FHB Integrated Management Trials. Available on scabusa.org website.

Bradley, C., Milus, E., Smith, M., Bergstrom, G., Cummings, J., Friskop, A., Paul, P., Byamukama, E., Ruden, K., and Smith, D. Report on the USWBSI-Supported-Uniform Fungicide Tests Conducted in 2013. Available on the scabusa.org website.