

**USDA-ARS/
U.S. Wheat and Barley Scab Initiative
FY11 Final Performance Report
July 13, 2012**

Cover Page

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Fiscal Year:	FY11
USDA-ARS Agreement ID:	59-0206-1-116
USDA-ARS Agreement Title:	Verification of the Value of Genetic Resistance and Fungicides on the Control of FHB in WW in ND.
FY11 USDA-ARS Award Amount:	\$ 36,561

USWBSI Individual Project(s)

USWBSI Research Category*	Project Title	ARS Award Amount
HW-CP	Verification of the Value of Genetic Resistance and Fungicides on the Control of FHB in Winter Wheat in North Dakota.	\$ 36,561
	Total ARS Award Amount	\$ 36,561

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
 HW-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: *Verification of the Value of Genetic Resistance and Fungicides on the Control of FHB in Winter Wheat in North Dakota.*

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

Winter wheat varieties adapted to North Dakota differ significantly in their level of Fusarium head blight (FHB) resistance. Furthermore, new backcrosses that contain the gene that has been the backbone of resistance in spring wheat varieties is now available in some winter wheat lines. Moreover, there is now sufficient seed of these backcrosses to allow plot size testing. Certain fungicides can be effective in reducing Fusarium head blight. The combination of best varieties and fungicides is thought to be the most effective way to reduce damage due to FHB in winter, but testing this concept has been difficult when relying on natural conditions. The research we are conducting as part of this project involves verifying the value of genetic resistance, fungicide applications and their combination using a misting system that helps ensure that we will be able obtain relevant data, even when the weather might not otherwise be conducive to FHB development. As part of this project we are also screening winter wheat lines developed by breeding programs in South Dakota, Nebraska, Kansas and private breeding companies for FHB resistance and adaptation. Our results will provide valuable information to these breeding program as to the effectiveness of the resistance they have bred into their materials and will provide information to growers in North Dakota as to their potential adaptation for use in North Dakota, should they ever be released.

2. List the most important accomplishment and its impact (i.e. how is it being used) to minimize the threat of Fusarium head blight or to reduce mycotoxins. Complete both sections (repeat sections for each major accomplishment):

Accomplishment:

Perhaps the biggest accomplishment this year was the successful installation of the misting system. This system was installed at the Research Extension Center at Carrington and functioned as planned so that high levels of FHB developed in the plots that were planted there. Prior to the actual misting of these plots there was excessive rainfall and foliar diseases were problematic, especially on varieties that did not have good foliar disease resistance. This made visually rating plots for FHB somewhat problematic. This is the first time that plots of sufficient size to allow for the determination of yield under a misting system were planted in North Dakota.

Impact:

The data obtained in 2011 showed that varieties that are currently classified as the most resistant to FHB in the states, in which they were developed, also have the best level of resistance in North Dakota. Information about the level of resistance of commercially available varieties will help winter wheat farmers that regularly confront FHB in selecting varieties that are adapted and will perform well under FHB pressure. This site will allow us to fully and consistently evaluate varieties for their resistance and to FHB, even in years

when weather might not be optimum for FHB development and to better quantify the value of fungicides in combination with resistance varieties in minimizing losses due to FHB and reducing DON levels in the grain.

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.

Ransom, J., G. McKee and M. McMullen. 2011. Impact of information sources on FHB control strategies adopted by spring wheat growers. In: S. Canty, A. Clark, A. Anderson-Scully, D. Ellis and D. Van Sanford (eds.). Proceedings of the 2011 National Fusarium Head Blight Forum. East Lansing, MI/Lexington, KY: U.S. Wheat & Barley Scab Initiative. pp. 143.

Ransom, J., M. McMullen, G. McKee. 2012. Adoption of integrated management methods for Fusarium head blight control. Invited oral presentation at the 7th International IPM Symposium, March 27-29, 2012, Memphis Tennessee.