

**USDA-ARS/  
U.S. Wheat and Barley Scab Initiative  
FY08 Final Performance Report (approx. May 08 – April 09)  
July 15, 2009**

**Cover Page**

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<b>Fiscal Year:</b>	2008
<b>USDA-ARS Agreement ID:</b>	59-0790-6-065
<b>USDA-ARS Agreement Title:</b>	Integrated Management of FHB in Spring and Winter Wheat in North Dakota.
<b>FY08 USDA-ARS Award Amount:</b>	\$ 22,859

**USWBSI Individual Project(s)**

<b>USWBSI Research Category*</b>	<b>Project Title</b>	<b>ARS Adjusted Award Amount</b>
MGMT	Integrating Management Practices to Control FHB and DON in Barley and Spring Wheat.	\$18,984
HWW-CP	Screening for FHB Resistance in the NHWWSN.	\$ 3,875
	<b>Total Award Amount</b>	<b>\$ 22,859</b>

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Principal Investigator

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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  
 HWW-CP – Hard Winter Wheat Coordinated Project  
 VDHR – Variety Development & Uniform Nurseries – Sub categories are below:  
     SPR – Spring Wheat Region  
     NWW – Northern Winter Wheat Region  
     SWW – Southern Sinter Wheat Region

(Form FPR08)

**Project 1:** *Integrating Management Practices to Control FHB and DON in Barley and Spring Wheat.*

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

Currently no single factor can control FHB in wheat and barley, so an integrated disease management approach is needed. Plant density and row spacing may play a role in the development of FHB and therefore could be a component of an integrated control program. Experiments were conducted during the 2008 growing season in Fargo, Prosper and Langdon, North Dakota to evaluate the influence of row spacing and plant density, when combined with fungicides and resistant cultivars on FHB severity in wheat and barley and on yield and crop quality.

The extension of best management practices is critical if they are to be adopted by growers confronted with scab-related losses. Research was initiated to determine the level of understanding of best practices by farmers and pathways by which farmers obtain scab-related information.

**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:**

The 2008 growing season was not conducive to scab development so there were no data obtained on the influence of planting patterns on scab development and control. We obtained additional information on the influence of seeding rates and row spacing on yield in the absence of disease which provided us with critical information on the interaction between these practices and the environment in non-disease years

We also obtained preliminary data on the type of management practices farmers have adopted and the way they obtain this information. These data will be used to design a more formal survey later in 2009.

**Impact:**

The impact of this activity has been in the development of data that quantify the effects of the various practices evaluated on yield so that as additional data are developed over additional environments, integrated crop and disease management recommendations can be extrapolated with more confidence.

We also now better understand the level of adoption of various scab-control practice and the most effective ways of communicating scab-control information to growers.

**Project 2:** *Screening for FHB Resistance in the NHWWSN.*

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

By screening advanced lines that potentially have resistance to FHB, new varieties can be identified that are adapted to ND and are less prone to FHB damage.

**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:**

A trial to screen the advanced lines provided by three winter wheat breeding programs was established for FHB in ND. All of the lines survived with winter and appeared to be adapted. There was almost no FHB development due to environmental conditions that were not conducive to the development of the disease, however.

**Impact:**

A multi-state effort to find FHB resistant cultivars was strengthened and expanded in scope.

**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.**

McMullen, M., S. Halley, B. Schatz, S. Meyer, J. Jordahl, and J. Ransom. 2008. Integrated strategies for Fusarium Head Blight management in the United States. Proceedings of the 3<sup>rd</sup> International Symposium on Fusarium Head Blight, Szeged, Hungary. Cereal Research Communications 36 (supplementum B): 563-568.

Ransom, J.K. and M.V. McMullen. 2008. Yield and disease control on hard winter wheat cultivars with foliar fungicides. Agronomy Journal 100:1130-1137.

Ransom, J.K. 2008. Plant height can be an important factor in the differential response of wheat varieties to Fusarium Head Blight development. Proceedings of the 3<sup>rd</sup> International Symposium on Fusarium Head Blight, Szeged, Hungary. Cereal Research Communications 36 (supplementum B): 593-594.

**If your FY08 USDA-ARS Grant contained a VDHR-related project, include below a list all germplasm or cultivars released with full or partial support of the USWBSI. List the release notice or publication. Briefly describe the level of FHB resistance. If this is not applicable (i.e. no VDHR-related project) to your FY08 grant, please insert 'Not Applicable' below.**

No releases.