

**USDA-ARS/  
U.S. Wheat and Barley Scab Initiative  
FY06 Final Performance Report (approx. May 06 – April 07)  
July 16, 2007**

**Cover Page**

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<b>Fiscal Year:</b>	2006
<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>FY06 ARS Award Amount:</b>	\$ 15,231

**USWBSI Individual Project(s)**

<b>USWBSI Research Area*</b>	<b>Project Title</b>	<b>ARS Award Amount</b>
CBCC	Integrated Management of FHB in Spring and Winter Wheat in North Dakota.	\$ 15,231
	<b>Total Award Amount</b>	<b>\$ 15,231</b>

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Principal Investigator

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Date

\* CBCC – Chemical, Biological & Cultural Control  
 EEDF – Etiology, Epidemiology & Disease Forecasting  
 FSTU – Food Safety, Toxicology, & Utilization of Mycotoxin-contaminated Grain  
 GET – Genetic Engineering & Transformation  
 HGR – Host Genetics Resources  
 HGG – Host Genetics & Genomics  
 PGG – Pathogen Genetics & Genomics  
 VDUN – Variety Development & Uniform Nurseries

**Project 1:** *Integrated Management of FHB in Spring and Winter Wheat in North Dakota.*

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

Fusarium Head Blight (FHB) continues to be one of the most serious constraints to small grain production in North Dakota. We wanted to know if consistent FHB control could be achieved by integrating tolerant cultivars, fungicides, crop management and crop rotation in spring and winter wheat in North Dakota. To address this question, a series of experiments were established in south eastern and north central ND where FHB is consistently most problematic for wheat production. One group of experiments looked at the interaction of fungicide and host plant resistance on overall FHB control in spring and winter wheat. Another set of experiments examined the effect of plant density on the effectiveness of fungicide in controlling FHB in spring wheat. Finally, through extensive on-farm monitoring the effect of crop rotation on the development of FHB and its control using genetic resistance and/or fungicides was investigated.

**2. List the most important accomplishment and its impact (how is it being used?).**

**Complete all three sections (repeat sections for each major accomplishment):**

**Accomplishment:**

Disease pressure was low during the 2006 growing season because of less than average precipitation during reproductive development of the crop. Winter wheat yields were improved with the application of fungicides when the experiment was planted on wheat stubble, but not on barley stubble. Varieties that were most susceptible to FHB had the largest yield increase when fungicide was applied. FHB levels were low and were not affected by fungicide or variety in these experiments. In another experiment, FHB control with fungicides was similar with all plant densities, but disease pressure was low. These data did indicate that a wide range of plant populations can produce the same level of yield in the absence of FHB, indicating that plant density might be a viable practice to include in an integrated control program, if in fact, plant density is found to influence disease development.

**Impact:**

Due to the lack of FHB, it was not possible to quantify the effect of the various treatments in controlling FHB. The value of rotation and fungicides, even in the absence of FHB was effectively demonstrated, however. This research combined with data from similar research started in 2005, confirms the importance of integrating control practices in order to consistently and economically control FHB, particularly in winter wheat.

**As a result of that accomplishment, what does your particular clientele, the scientific community, and agriculture as a whole have now that they didn't have before?**

The benefits and limitations of a single application of fungicide in controlling diseases and improving yield in a range of environments has now been documented. This information was presented as a poster at a recent meeting in Canada of North American wheat researchers so that some key members of the scientific community are aware of this response.

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**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.**

Presentations

Ransom, J.K. and S. Meyers. 2007. Response of winter wheat genotypes to fungicide applied at flowering in eastern North Dakota. Poster presentation at the North American Wheat Workers Workshop, March 12-14, 2007, Saskatoon, Canada.