

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

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Fiscal Year:	2006
USDA-ARS Agreement ID:	59-0790-6-062
USDA-ARS Agreement Title:	Field Evaluations of Chemical Controls for Fusarium Head Blight in Michigan.
FY06 ARS Award Amount:	\$ 13,675

USWBSI Individual Project(s)

USWBSI Research Area*	Project Title	ARS Award Amount
CBCC	Field Evaluations of Chemical Controls for Fusarium Head Blight in Michigan.	\$ 13,675
	Total Award Amount	\$ 13,675

Principal Investigator

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: *Field Evaluations of Chemical Controls for Fusarium Head Blight in Michigan.*

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

Finding fungicides that are more effective against Fusarium head blight (FHB) that reduce levels of mycotoxins (DON) is an ongoing challenge and an important aspect of managing FHB. Even a small reduction in DON can make a big difference in the price the farmer receives at the elevator and makes a big difference to the millers who process the grain. Our project to evaluate the performance of fungicides under field conditions in Michigan is part of a larger coordinated effort to examine the effects of new or recently labeled fungicides on yield and grain quality on a much larger scale. The uniform fungicide trials provide essential information about the efficacy of these fungicides across a broad spectrum of wheat varieties and field environments. Scab outbreaks are not an annual event in Michigan. Having effective products to use against scab is important, but it is equally important to have reliable models to provide decision-making tools on when (and if) fungicides need to be applied. We also utilize the fungicide trial locations to “ground-truth” weather-based predictive models for the risk of FHB epidemic conditions (Penn State Model) and the development of DON (DONCast model)

**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:

- In general, the weather in Michigan in 2006 was not conducive to the development of scab, and disease pressure was very light. Very little scab developed at the three dryland locations, and only moderate amounts of scab at the irrigated, inoculated site (East Lansing). The only location with any appreciable amount of DON was East Lansing. Although there were differences in DON levels among several treatments and the control, none were statistically significant. There were a few differences in yield, FHB severity and index among the locations.
- Despite the fact that we did not have appreciable amounts of scab to evaluate in 2006, we gained valuable information about the efficacy of the fungicides tested against foliar diseases. The weather station data collected from the sites, used with the Penn State Model correctly predicted low or low to medium risk of an epidemic. The DONCast predictions provided additional useful information comparing actual DON levels to those predicted. Even in non-epidemic years, we can show the link between disease levels and fungicide use and differences in yield and grain quality, and demonstrate that fungicides don't provide measurable benefits unless disease is present at economic levels, and examine the usefulness of models as decision-making tools.

Impact:

Because of the research conducted, growers have additional useful information about how effectively certain fungicides worked against foliar diseases of wheat in Michigan, and a better understanding of when applying fungicides produces measurable benefits, and when it won't. Growers can see examples of what worked, and get university-based information related to our wheat research at extension meetings, through newsletters and fact sheets.

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?

Growers have additional useful information about fungicide efficacy against foliar diseases of wheat in Michigan for products that may be on the market soon. They have a better understanding of when applying fungicides produces measurable benefits, and when it won't. The scientific community benefits from having additional fungicide efficacy data across a range of environments and wheat varieties. The uniform fungicide trials as a whole provide evidence to support labeling for new fungicides, and agriculture as a whole benefits by having new, more effective tools to combat important diseases and improve grain quality.

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.

Research Reports

- Brown-Rytlewski, D., Kirk, W., Schafer, R. and Berry, D. 2007. Evaluation of fungicides for control of Fusarium head scab of winter wheat at Williamston, MI, Plant Disease Management Reports, 2006. 1:CF016.
- Brown-Rytlewski, D., Kirk, W., Schafer, R. and Berry, D. 2007. Evaluation of fungicides for control of Fusarium head scab of winter wheat at Sandusky, MI, Plant Disease Management Reports, 2006. 1:CF017.
- Brown-Rytlewski, D., Kirk, W., Schafer, R. and Berry, D. 2007. Evaluation of fungicides for control of Fusarium head scab of winter wheat at East Lansing, MI, Plant Disease Management Reports, 2006. 1:CF018.
- Brown-Rytlewski, D., Kirk, W., Schafer, R. and Berry, D. 2007. Evaluation of fungicides for control of Fusarium head scab of winter wheat at Saginaw, MI, Plant Disease Management Reports, 2006. 1:CF019.
- Brown-Rytlewski, D., Kirk, W., Schafer, R., Berry, D. and Liddell, L. 2006. 2006 FHB Uniform Fungicide Trials on Winter Wheat in Michigan Proceedings of the National Head Blight Forum, 2006 Dec 10-12, Research Triangle Park, NC. p.7

Presentations

- D. E. Brown- Rytlewski 2006 Wheat Disease and Research Update. Agribusiness Meeting, December 20, 2006 East Lansing, MI
- D. E. Brown- Rytlewski 2006 Wheat Disease and Research Update. Pest Management Meetings, January 16, 17, 22, 23, and 24, 2006. Alma, Richville, Attica, Peck, and Ubyly, MI.
- D. E. Brown- Rytlewski 2006 Wheat Disease and Research Update Ag Action Day, January 16, 2007. Kalamazoo, MI
- D. E. Brown- Rytlewski 2006 Wheat Disease and Research Update. Pest Management Meetings, February 12, 13, and 22, 2007. Dowagiac, Mason, and Standish, MI.
- D. E. Brown- Rytlewski 2006 Wheat Disease and Research Update. Lenawee County Grower's Meeting, March 13, 2007. Ann Arbor, MI

Extension Bulletins

- Brown- Rytlewski, D., Kirk W., and Naglekirk, M. 2007. Management of Foliar Wheat Diseases. Michigan State University Extension, Field Crops AoE team website, <http://fieldcrop.msu.edu/documents/wheat>
- Brown- Rytlewski, D., Kirk W., and Naglekirk, M. 2007 Management of Fusarium Head Blight (Scab) Michigan State University Extension, Field Crops AoE team website, <http://fieldcrop.msu.edu/documents/wheat>