USDA-ARS/
U.S. Wheat and Barley Scab Initiative
FY14 Final Performance Report
July 15, 2015

Cover Page

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Fiscal Year:	FY14
USDA-ARS Agreement ID:	59-0206-4-017
USDA-ARS Agreement Title:	Integrated Management of Fusarium Head Blight in Indiana.
FY14 USDA-ARS Award Amount:	$ 7,270

USWBSI Individual Project(s)

USWBSI Research Category*	Project Title	ARS Award Amount
MGMT	Integrated Management Strategies for Fusarium Head Blight of Wheat in Indiana.	$ 7,270
	FY14 Total ARS Award Amount	**$ 7,270**

7/14/15

Principal Investigator Date

* MGMT – FHB Management
FSTU – Food Safety, Toxicology, & Utilization of Mycotoxin-contaminated Grain
GDER – Gene Discovery & Engineering Resistance
PBG – Pathogen Biology & Genetics
EC-HQ – Executive Committee-Headquarters
BAR-CP – Barley Coordinated Project
DUR-CP – Durum Coordinated Project
HWW-CP – Hard Winter Wheat Coordinated Project
WES-CP – Western 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 Strategies for Fusarium Head Blight of Wheat in Indiana.*

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

   Fusarium Head Blight (FHB) levels on wheat vary each year in Indiana but the disease is consistently present and of concern to growers, and there is a need for effective FHB and deoxynivalenol (DON) management programs. Varieties with moderate resistance to FHB do not always provide desirable levels of disease control in certain environments, and fungicides have become an important component in FHB and DON management plans in the region. Application timing of fungicides has been a recent concern, since weather conditions often prohibit applications at the optimum timing of early anthesis. Research to determine the window of effective fungicide timing for FHB and DON in Indiana combined with varietal resistance helps farmers manage this disease.

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: A research trial was conducted in West Lafayette, IN to evaluate the effect of genetic resistance and fungicide application timing to achieve optimal management of FHB and DON. The fungicide Prosaro® was applied to experimental plots of six varieties of varying susceptibility to FHB at Feekes 10.5.1 and 2, 4, and 6 days after anthesis. Non-treated plots of each of the varieties were included in the experiment to test the effects of a foliar fungicide application at Feekes 10.5.1, and variety susceptibility for improved FHB management. Treatments were replicated across plots that were inoculated with *Fusarium graminearum*, and non-inoculated plots were also included for each treatment. FHB levels were moderate in the trial, and DON levels exceeded 1.0 ppm in all treatments. Plots receiving fungicide applications did yield higher across all varieties, and resulted in reduced levels of DON in the susceptible variety.
   The most resistant varieties had lower FHB and DON at all fungicide timings compared to the untreated, including applications made up to 6 days after anthesis. The most susceptible varieties had lower FHB and DON with applications made after anthesis compared to no application or applications made at anthesis.

   Impact: This research indicates that fungicide applications of Prosaro can reduce FHB and DON and increase yield when conditions are favorable for FHB development. It also indicates that for some varieties, applications made shortly after anthesis may provide similar levels of FHB and DON control as applications made at anthesis. These findings indicate that farmers may have more flexibility in application timing, should weather prevent applications at anthesis. Management recommendations distributed to Indiana wheat farmers will indicate that a combination of variety resistance and fungicide application are most efficacious at minimizing the impact of FHB and DON.

This information is of primary importance to growers and is presented in various programs and field days, and also contributes data to help refine the national FHB forecasting model. Research results are summarized in Extension articles to aid growers in managing FHB and DON in wheat. Additional research is needed to more thoroughly investigate the interaction between fungicide and variety susceptibility under Indiana conditions under conditions more favorable for FHB.

Training of Next Generation Scientists

Instructions: Please answer the following questions as it pertains to the FY14 award period. The term "support" below includes any level of benefit to the student, ranging from full stipend plus tuition to the situation where the student's stipend was paid from other funds, but who learned how to rate scab in a misted nursery paid for by the USWBSI, and anything in between.

1. **Did any graduate students in your research program supported by funding from your USWBSI grant earn their MS degree during the FY14 award period?** Yes

   If yes, how many? 1

2. **Did any graduate students in your research program supported by funding from your USWBSI grant earn their Ph.D. degree during the FY14 award period?** No

   If yes, how many?

3. **Have any post docs who worked for you during the FY14 award period and were supported by funding from your USWBSI grant taken faculty positions with universities?** None

   If yes, how many?

4. **Have any post docs who worked for you during the FY14 award period and were supported by funding from your USWBSI grant gone on to take positions with private ag-related companies or federal agencies?** None

   If yes, how many?

Include below a list of all germplasm or cultivars released with full or partial support of the USWBSI during the FY14 award period. List the release notice or publication. Briefly describe the level of FHB resistance. *If not applicable because your grant did NOT include any VDHR-related projects, enter N/A below.*

N/A

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 FY14 grant. Please reference each item using an accepted journal format. If you need more space, continue the list on the next page.

Wise, K. 2014. Fusarium head blight (scab) management in wheat. Purdue Pest and Crop Newsletter. Issue 7: May 23, 2014.

Wise, K. 2014. Dealing with DON in wheat. Purdue Pest and Crop Newsletter. Issue 11: June 20, 2014.