USDA-ARS/
U.S. Wheat and Barley Scab Initiative
FY16 Final Performance Report
Due date: July 28, 2017

Cover Page

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Fiscal Year:	2016
USDA-ARS Agreement ID:	59-0206-2-086 (NCE) & 59-0206-6-016
USDA-ARS Agreement Title:	Continued Deployment of Prediction Models for Fusarium Head Blight.
FY16 USDA-ARS Award Amount:	$ 31,417
Recipient Organization:	The Pennsylvania State University Research Accounting 227 W Beaver Ave, Ste 401 State College, PA 16801-4819
DUNS Number:	00-340-3953
EIN:	24-6000376
Recipient Identifying Number or Account Number:	424-07 (75J4) & 424-18 (74UY)
Project/Grant Reporting Period:	6/8/16 - 6/7/17
Reporting Period End Date:	06/07/17

USWBSI Individual Project(s)

USWBSI Research Category*	Project Title	ARS Award Amount
MGMT	Continued Deployment of Prediction Models for Fusarium Head Blight.	$ 31,417
	FY16 Total ARS Award Amount	**$ 31,417**

Kyle Imhoff

7/20/17

Principal Investigator Date

* MGMT – FHB Management
FST – Food Safety & Toxicology
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
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

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Project 1: *Continued Deployment of Prediction Models for Fusarium Head Blight.*

1. What are the major goals and objectives of the project?

We are addressing the risk of scab development during the critical flowering stage when the growers can ameliorate the risk with treatment. This project leverages various atmospheric data networks, including the finest scale and most accurate gridded data set (URMA and RTMA), gridded model data and a host of regression based epidemiological models on a user-friendly graphic interface to assist growers in decision making in protecting their fields from scab. Using hourly reports of temperature and moisture from standard networks, agricultural networks, proxy agricultural networks (CWOP) and finely gridded data, each day the risk is assessed anew with the most recent observations and is available by mid-morning.

2. What was accomplished under these goals? *Address items 1-4) below for each goal or objective.*

1) major activities
    a. A successful daily prediction using various scab risk models have been run throughout the wheat growing season (Mar-Aug, 2016 and 2017) from winter wheat in the southern Plains to late spring wheat in the Dakotas. Additional expert commentary is included from plant pathologists in most states to augment the utility of the interface. The tools are also available on mobile apps and risk in non-growing regions is being masked to prevent misinterpretation of the risk tool.
2) specific objectives
    a. The following objectives were accomplished:
        i. Continued deployment of the disease prediction models in 30 states including the support of the state commentary tools, FHB Alerts and the web-page information explaining the models.
        ii. Continued support of the new backup system for improved system stability.
        iii. Maintained a version of the FHB Prediction Center for use with mobile devices (cellular-based mobile/"smart" phones and tablets).
        iv. Verify model inputs and improved capacity for site¬-specific predictions.
3) significant results
    a. See outcomes/achievements
4) key outcomes or other achievements

- Growers are using the interface and models to assist in crucial decisions about the risk of scab in their region. When there are any breaks in the data stream that produces the risk assessment tool, we receive immediate response. In late 2015, the use of Unrestricted Real-time Mesoscale Analysis gridded data with the tool was discussed and implemented in the 2016 season. URMA utilizes additional data and quality control to improve on the base RTMA data set that has been used in the risk tool. The tool continued to utilize 17 independent agricultural (or proxy agricultural) networks, covering 25 states, in addition to FAA sites during the 2016 growing season. Work will continue on improving the user interface functionality and the expert site tools.

3. What opportunities for training and professional development has the project provided?

Nothing to Report

4. How have the results been disseminated to communities of interest?

The target audience of growers and extension personnel that advise grower consortiums receive information through the web interface. Experts provide commentary within the interface that report status of the wheat/barley crops as well as an assessment of disease risk. The interface is located at: http://www.wheatscab.psu.edu/.

Training of Next Generation Scientists

Instructions: Please answer the following questions as it pertains to the FY16 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 FY16 award period?** No

   If yes, how many?

2. **Did any graduate students in your research program supported by funding from your USWBSI grant earn their Ph.D. degree during the FY16 award period?** No

   If yes, how many?

3. **Have any post docs who worked for you during the FY16 award period and were supported by funding from your USWBSI grant taken faculty positions with universities?** No

   If yes, how many?

4. **Have any post docs who worked for you during the FY16 award period and were supported by funding from your USWBSI grant gone on to take positions with private ag-related companies or federal agencies?** No

   If yes, how many?

Release of Germplasm/Cultivars

Instructions: In the table below, list all germplasm and/or cultivars released with full or partial support through the USWBSI during the FY16 award period. All columns must be completed for each listed germplasm/cultivar. Use the key below the table for Grain Class abbreviations. *Leave blank if you have nothing to report or if your grant did NOT include any VDHR-related projects.*

Name of Germplasm/Cultivar	**Grain Class**	**FHB Resistance** (S, MS, MR, R, where R represents your most resistant check)	**FHB Rating** (0-9)	**Year Released**

Add rows if needed.

NOTE: List the associated release notice or publication under the appropriate sub-section in the 'Publications' section of the FPR.

Abbreviations for Grain Classes

Barley - BAR
Durum - DUR
Hard Red Winter - HRW
Hard White Winter - HWW
Hard Red Spring - HRS
Soft Red Winter - SRW
Soft White Winter - SWW

Publications, Conference Papers, and Presentations

Instructions: Refer to the FY16-FPR_Instructions for detailed instructions for listing publications/presentations about your work that resulted from all of the projects included in the FY16 grant. Only include citations for publications submitted or presentations given during your award period (6/8/16 - 6/7/17). If you did not have any publications or presentations, state 'Nothing to Report' directly above the Journal publications section.

Journal publications.

Books or other non-periodical, one-time publications.

Bockus, W.W., De Wolf, E. D. and Wegulo, S. N. 2016. Effect of Prosaro® fungicide application on Fusarium head blight in seven winter wheat cultivars, 2015. *Plant Disease Management Reports* 10:CF042.
Status: Published Technical Report
Acknowledgement of Federal Support: Yes

Other publications, conference papers and presentations.

DeWolf, E., Knapp, M. and Lollato, R. 2016. Risk of Fusarium head blight (scab) in wheat. KSU Agronomy eUpdate No. 566.
Status: Published extension newsletter
Acknowledgement of Federal Support: No