USDA-ARS/
U.S. Wheat and Barley Scab Initiative
FY15 Final Performance Report
Due date: July 15, 2016

Cover Page

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Fiscal Year:	2015
USDA-ARS Agreement ID:	59-0206-4-036
USDA-ARS Agreement Title:	USWBSI Integrated Management of FHB on Delaware Wheat.
FY15 USDA-ARS Award Amount:	$ 9,718
Recipient Organization:	University of Delaware 210 H
DUNS Number:	59007500
EIN:	51-6000297
Recipient Identifying Number or Account Number:	AGEX35212215000 AGEX35212815000
Project/Grant Reporting Period:	06/01/15-05/31/16
Reporting Period End Date:	05/31/16

USWBSI Individual Project(s)

USWBSI Research Category*	Project Title	ARS Award Amount
MGMT	Integrated Management of Delaware Wheat.	$ 9,718
	FY15 Total ARS Award Amount	**$ 9,718**

7/6/16

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

Project 1: *Integrated Management of Delaware Wheat.*

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

The objective of the proposed study is to evaluate the effects of cultivar resistance and timing of Prosaro® on FHB severity and DON in soft red winter wheat grown under Midatlantic growing conditions.

2. What was accomplished under these goals?

1) major activities
    a. Field experiments were conducted at the Carvel Research and Education Center at Georgetown, DE from Fall, 2014 through Summer, 2015. The Wheat Varieties Pioneer 25R32 and 25R50 (both MR), Pioneer 25R40 and Dynagro Shirley (both S). These varieties were arranged in a split plot design with fungicide treatment crossed with variety. Fungicide treatments consisted of Prosaro applied at Feekes 10.5.1 or 4, 6, or 8 days after Feekes 10.5.1. All plots were inoculated with a suspension of *Fusarium graminearum* spores at Feekes 10.5.1. All plots were assessed for visual symptoms for Fusarium head blight 21 days after Feekes 10.5.1. Plots were harvested for yield, and subsamples sent for DON analysis. Data were shared with stakeholders at fourteen regional and county based meetings of stakeholders and agricultural professionals throughout Maryland and Delaware. A poster discussing results was presented at the APS Potomac Divisional meeting in 2016. Data were sent to Dr. Pierce Paul at OSU to be included in a wide scale metaanalysis.
2) specific objectives
    a. Determine if suppression of DON and FHB by Prosaro fungicide is consistent across varieties of contrasting resistance level when grown under Delaware growing conditions.
    b. Determine if variety and application timing up to 8 days after Feekes 10.5.1 impacts efficacy of Prosaro applications.
3) significant results
    a. Results indicated that applications of Prosaro up to 8 days after anthesis may result in reduction of FHB and DON similar to those achieved when applied at Feekes 10.5.1.
    b. Results were variable, but overall, reduction in visual symptoms of Fusarium head blight and DON were similar across varieties of contrasting resistance to Fusarium head blight.
    c. Due to dry growing conditions, the amount of disease and DON were low. Consequently, efficacy and consistency of fungicide applications may not adequately reflect situations where disease levels are high. To address this, similar studies were conducted across a range of growing conditions and varieties across the Unites States as part of the MGMT-CP project.

4) key outcomes or other achievements

a. To our knowledge, this is the first time that efficacy of Prosaro applied up to 8 days after Feekes growth stage 10.5.1 has been reported on multiple varieties. These results may impact future treatments for MGMT CP projects. In addition, we included additional varieties to our study, improving impact and scope of our data and results.

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

I was able to mentor and train students and new working professionals in plant pathology methods and basic field pathology research. Technicians and undergraduate summer workers learned about field preparation, plot design and layout, and experimental design. In addition, these individuals learned basic plant pathology methods, such as fungal isolation, hyphal tipping, media preparation, corn spawn production, rating, data entry, and basic interpretation of data analysis. Christopher Ramage, an undergraduate student intern, shared some of these results in local and regional scientific meetings, gaining experience in preparation of scientific presentations and public speaking. Andy Kness, a new technician in the UD Field Crops Pathology lab, was able to help prepare and present a poster with our results at the APS Potomac Divisional meeting in 2016.

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

Results have been shared with Agricultural professionals (consultants, agronomists, seed salesmen, fertilizer sales reps, chemical reps, etc.) and stakeholders through multiple means. Fourteen presentations were delivered that discussed these results and updates in FHB management in FY 2015. These included multiple, large scale presentations at the Delaware Ag Week, Eddie Mercer Field Day, and Maryland Commodity Board Annual Meeting. An invited online session was delivered to 35 Industry agronomists and CCA's in 23 states, representing over 1850 growers producing more than 95,500 acres of wheat. Survey results indicated that the value of the information could result in over $4.9 million in production value across wheat growing regions of the central and Eastern United States. Data were shared with the scientific community at the 2016 APS Potomac Meeting as a contributed poster.

Training of Next Generation Scientists

Instructions: Please answer the following questions as it pertains to the FY15 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 FY15 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 FY15 award period?** No

   If yes, how many?

3. **Have any post docs who worked for you during the FY15 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 FY15 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 FY15 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
Refer to the FY15-FPR_Instructions for listing publications/presentations about your work that resulted from all of the projects included in the FY15 grant. If you did not have any publications or presentations, state 'Nothing to Report' directly above the Journal publications section.

Other publications, conference papers and presentations.

Abstracts

1. **N.M. Kleczewski**. 2016. Effects of variety and fungicide timing on suppression of Fusarium Head Blight and Vomitoxin in wheat grown in Delaware. American Phytopathological Society Potomac Division. Richmond, VA, March 23-25.
   Status: published
   Acknowledgement of Federal Support: yes

Presentations

1. **N.M. Kleczewski.** 2016. "An Overview of Glume Blotch and Fusarium Head Blight Management." Mid-Atlantic Wheat Quality Meeting. Harrington, DE.
2. **N.M. Kleczewski.** 2016. "Stripe Rust and Head Blight." Eddie Mercer Small Grains Field Day. .Frederick, MD.
3. **N.M. Kleczewski.** 2016. "Updates on small grains disease research in Delaware." Sussex Small Grains Day. Harbenson, DE.
4. **N.M. Kleczewski.** 2016. "Small Grains Disease Research Updates." Wye Mills Twilight Tour. Wye Mills, MD.
5. **N.M. Kleczewski.** 2016. "Small Grains Disease Updates and Variety Selection." Newcastle County Twilight Meeting. Middletown, DE.
6. **N.M. Kleczewski.** 2016. "Agronomic Diseases and Fungicides in Agronomic Crops"**.** Rutgers Pesticide Safety Meeting. Woodstown, NJ.
7. **N.M. Kleczewski.** 2016. **"**Barley Yellow Dwarf, Soybean Vein Necrosis Disease, and Fusarium Head Blight" EIPM Update Meeting. Dover, DE.
8. **N.M. Kleczewski.** 2016. "Fusarium Head Blight Management, Soybean Vein Necrosis Virus, and Tar Spot." Denton Pesticide Applicator Conference. Denton, MD.
9. **N.M. Kleczewski.** 2016. "Updates on Field Crop Disease Management." Frederick Pesticide Applicator Conference. Frederick, MD.
10. **N.M. Kleczewski.** 2016. "Agronomic Disease Management and Research Updates." Maryland Crop Improvement Board. Annapolis, MD.
11. **N.M. Kleczewski.** 2016 . "Agronomic Diseases." Cecil County Agriculture Day. Rising Son, MD.
12. **N.M. Kleczewski.** 2016. "Updates on Agronomic Disease Management." Lower Shower Agronomy Day**.** Lower Tri County, MD.
13. **N.M. Kleczewski.** 2016. **"**Agronomic Disease Management Updates." Delaware Ag. Week . Harrington, DE.
14. **N.M. Kleczewski.** 2015. "Management of Fusarium head blight in wheat." Pioneer Agronomy Special Session. Online.