USDA-ARS
U.S. Wheat and Barley Scab Initiative
FY17 Final Performance Report – NCE for FY18
Due date: July 12, 2019

Cover Page

Principle Investigator (PI):	Alyssa Collins
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Fiscal Year:	2017 (NCE for FY18)
USDA-ARS Agreement ID:	59-0206-5-005
USDA-ARS Agreement Title:	Management of Spring and Winter Barley in the Mid-Atlantic for Scab.
FY17 USDA-ARS Award Amount:	$ 15,744
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:	404-49 (74TU)
Project/Grant Reporting Period:	6/1/18 - 5/31/19
Reporting Period End Date:	05/31/19

USWBSI Individual Project(s)

USWBSI Research Category*	Project Title	ARS Award Amount
MGMT	Management of Fusarium Head Blight on Barley in the Mid-Atlantic.	$ 15,744
	FY17 Total ARS Award Amount	$ 15,744

Alyssa A Collins

8/12/19

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: *Management of Fusarium Head Blight on Barley in the Mid-Atlantic.*

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

1) Evaluate the integrated effects of fungicide and genetic resistance on FHB and DON in all major grain classes, with emphasis on double applications and new genotypes;
2) generate data to conduct an economic analysis of the integrated effects of fungicide and resistance on FHB/DON;
3) Develop more robust "*best-management practices*" for FHB and DON; and
4) generate data to advance the FHB and DON risk prediction effort.

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

1) major activities
   a. For (1, 2, and 3), we established an integrated management trial for adapted barley varieties in two regions of Pennsylvania, with the first at the Russell E. Larson Agricultural Research Center in Centre County and the second at the Southeast Agricultural Research and Extension Center in Lancaster County.
   b. For (1 and 2), all trials were established with the specific goal to study the combination of genetics (resistance) and fungicide active ingredient and timing in order to understand return on investment for management practices.
   c. For (3), we used our observations in the trials in both regions to inform communications through our Penn State Extension Field and Forage Crop Team network to disseminate information throughout Pennsylvania to manage the challenges that FHB posed during the 2018 growing season and recommendations
   d. For (4), we monitored FHB development as a result of the natural infection in our trials compared to risk levels predicted by the risk prediction tool. Feedback was provided to developers in order to enhance accuracy of the tool in our region.

2) specific objectives
   Through the establishment of these trials, we examined the regional impact of varietal resistance, fungicide, and fungicide application timing on grain quality and yield. These plots also served as a focal point for repeated extension programming in disease management in grain production, explicitly malting barley production.

3) significant results
   While data collection is ongoing, including FDK and DON analysis, preliminary observation suggests robust infection levels and measurable impact of fungicide applications.

4) key outcomes or other achievements
   - Establishment of field trials in two major growing regions of PA, with representation of malting varieties

- Quality-focused programming and education delivery centered on controlling FHB in malting barley delivered to over 1,500 contacts in the mid-Atlantic region

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

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This project provided opportunities for two undergraduate students to learn about barley production, FHB management, and applied research through their work supporting our goals.

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

For the period 2018-2019, Co-PIs Esker and Collins presented FHB-related information in 32 meetings to 1646 participants in Pennsylvania and the eastern region.

Co-PI Collins wrote 7 updates for the Fusarium Head Blight Prediction Center.

Co-PI Collins conducted two “Specialty Grain Study Circles” (including focus on malting barley) with farmers to support intensive management programs for high-quality production.

Furthermore, we wrote several articles for our Field Crop News publication for the Field and Forage Crop Team of Penn State Extension (see publications).

Lastly, the co-PIs (Collins and Esker) were invited to present an invited talk at the 2018 National
Fusarium Head Blight Forum on the challenges for FHB management in the northeastern USA

Training of Next Generation Scientists

Instructions: Please answer the following questions as it pertains to the FY17-NCE 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 FY17-NCE 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 FY17-NCE period?** No

   If yes, how many?

3. **Have any post docs who worked for you during the FY17-NCE 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 FY17-NCE 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 FY17-NCE period. All columns must be completed for each listed germplasm/cultivar. Use the key below the table for Grain Class abbreviations.

NOTE: 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 FY17-NCE_FPR-Instructions for detailed instructions for listing publications/presentations about your work that resulted from all of the projects included in the FY17-NCE grant period. Only include citations for publications submitted or presentations given during your award period (6/1/18 - 5/31/19). If you did not have any publications or presentations, state 'Nothing to Report' directly above the Journal publications section.

NOTE: Directly below each reference/citation, you must indicate the Status (i.e. published, submitted, etc.) and whether acknowledgement of Federal support was indicated in publication/ presentation.

Journal publications.

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

Other publications, conference papers and presentations.

Collins, A. A., & Esker, P. (2018). Understanding cultural impacts on scab management adoption in the East. In Canty, S., A. Hoffstetter, B. Wiermer and R. Dill-Macky (Eds.), *Proceedings of the 2018 National Fusarium Head Blight Forum.* (pp. 17). East Lansing, MI/Lexington, KY: U.S. Wheat & Barley Scab Initiative.
Status: Presentation given
Acknowledgement of Federal Support: Yes

Collins, A. A., & Esker, P. (2019). Fusarium head scab update. *Field Crop News - Penn State Extension.* http://extension.psu.edu/fusarium-head-scab-update.
Status: Published
Acknowledgement of Federal Support: No

Esker, P. & Collins, A. A. (2019). Fusarium head scab update for May 28, 2019. *Field Crop News - Penn State Extension.* http://extension.psu.edu/fusarium-head-scab-update-for-may-28-2019.
Status: Published
Acknowledgement of Federal Support: No

Collins, A. A., Esker, P., & Murillo-Williams, A. (2019). Scouting and quantifying Fusarium head blight in small grains. *Field Crop News - Penn State Extension.* http://extension.psu.edu/scouting-and-quantifyingfusarium-head-blight-in-small-grains.
Status: Published
Acknowledgement of Federal Support: No