

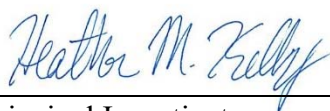
USDA-ARS
U.S. Wheat and Barley Scab Initiative
FY17 Final Performance Report
Due date: July 31, 2018

Cover Page

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| Principle Investigator (PI): | Heather Kelly |
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| Phone: | 865-974-7357 |
| Fiscal Year: | 2017 |
| USDA-ARS Agreement ID: | 59-0206-6-009 |
| USDA-ARS Agreement Title: | Integrated Management of FHB and DON in Soft Red Winter Wheat in Tennessee. |
| FY17 USDA-ARS Award Amount: | \$ 10,692 |
| Recipient Organization: | UTIA Office of Sponsored Programs 2621 Morgan Circle Drive 225 Morgan Hall Knoxville, TN 37996-4514 |
| DUNS Number: | 133891015 |
| EIN: | 62-6001636 |
| Recipient Identifying Number or Account Number: | R11-1017-338 |
| Project/Grant Reporting Period: | 6/1/17 - 5/31/18 |
| Reporting Period End Date: | 05/31/18 |

USWBSI Individual Project(s)

| USWBSI Research Category* | Project Title | ARS Award Amount |
|----------------------------------|---|-------------------------|
| MGMT | Integrated Management of FHB and DON in Soft Red Winter Wheat in Tennessee. | \$ 10,692 |
| | FY17 Total ARS Award Amount | \$ 10,692 |



Principal Investigator

8/3/2018

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 FHB and DON in Soft Red Winter Wheat in Tennessee.

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

- 1) *Develop integrated management strategies for FHB and mycotoxins that are robust to conditions experienced in production fields*
- 2) *Help develop and validate the next generation of management tools for FHB/DON control”.*

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

- 1) major activities
 Field trials were conducted at three locations in west Tennessee. Two of the trials investigated two cultivars (moderately resistant and susceptible to FHB) and three fungicide treatments (one of the products was tested at two different timings). The third trial investigated 2 fungicide products (with one product tested at two different timings) under tilled and no-till cultivation. While we did not experience high levels of FHB in TN, yield will be shared and compiled with others in the MGMT_CP.
- 2) specific objectives
 In TN there is now unbiased data on fungicide products on moderately resistant and susceptible FHB cultivars, both on influence on disease and mycotoxin levels as well as yield. TN will also help validate the FHB forecast model as it predicted low risk in west TN and was correct.
- 3) significant results
 Even with low disease pressure in Tennessee, the resistant FHB variety (Pioneer P26R36) yielded better than the susceptible at both locations they were compared and had lower FHB ratings (Table 1). Although no significant differences occurred due to fungicide treatments on yield at the WTREC location there was significant effect on leaf spots, where every treatment reduced leaf spot compared to non-treated check (Table 2). Similarly, no-till had significantly greater yield than plots that had been tilled and no effect of fungicide treatments occurred (Table 3).

Table 1

| Variety | Yield (bu/a) | | FHB Severity | | FHB Incidence | |
|--------------|--------------|----------|--------------|---|---------------|---|
| | Milan | WTREC | WTREC | | | |
| Pioneer26R59 | 56.3 b | 49.3 b | 2 | a | 9.7 | a |
| Pioneer26R36 | 68.2 a | 62.1 a | 0.2 | b | 0.8 | b |
| p-value | | 0.0001 | 0.0002 | | 0.0098 | |

Table 2

| Treatments (fl oz/a and timing) | Leaf spots WTREC (% leaf area affected) | |
|---------------------------------|---|---|
| Non-treated check | 11.6 | a |
| Prosaro 6.5 @ F10.5.1 | 1.9 | b |
| Miravis Ace 13.7 @ F10.3 | 1.4 | b |
| Miravis Ace 13.7 @ F10.5.1 | 0.4 | b |
| Caramba 10 @ F10.5.1 | 3.4 | b |
| p-value | 0.0003 | |

Table 3

| | Yield (bu/a) | |
|---------|--------------|---|
| No-till | 26.2 | b |
| Till | 30.5 | a |
| p-value | 0.0486 | |

4) key outcomes or other achievements

Data from the research trials and correlation to the FHB forecast model will be used at production meetings during the winter months to producers, consultants, and Extension agents in Tennessee.

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

Undergraduate summer interns within the Field Crops Plant Pathology program at University of Tennessee were able use the trial at WTREC to learn about and rate leaf spot diseases (septoria and stagonospora leaf spots) and FHB. Additionally, they took images to process through the app Canopeo to determine if simply imagery was able to pick up the little differences in the field (in this case it was not). The summer interns also helped establish and maintain the field trials within this project which helped them understand details of research (i.e. randomized complete block design, factorial design, need for replication, etc.). Also data from the research trials and correlation to the FHB forecast model will be used at production meetings during the winter months to producers, consultants, and Extension agents in Tennessee.

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

Data from the research trials and correlation to the FHB forecast model will be used at production meetings during the winter months to producers, consultants, and Extension agents in Tennessee.

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Training of Next Generation Scientists

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

If yes, how many?

3. **Have any post docs who worked for you during the FY17 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 FY17 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?

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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 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 |
|----------------------------|-------------|--|------------------------|------------------|
| | | | | |
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| | | | | |
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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

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Publications, Conference Papers, and Presentations

Instructions: Refer to the FY17-FPR_Instructions for detailed instructions for listing publications/presentations about your work that resulted from all of the projects included in the FY17 grant. Only include citations for publications submitted or presentations given during your award period (6/1/17 - 5/31/18). 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.

2 Wheat disease blog articles were published at news.utcrops.com

Prevent Scabby Heads – Forecast for Fusarium Head Blight in Wheat -

<http://news.utcrops.com/2018/04/prevent-scabby-heads-forecast-for-fusarium-head-blight-in-wheat/>

Wheat Disease Update - <http://news.utcrops.com/2018/05/wheat-disease-update-2/>

Status: Published

Acknowledgement of Federal Support: Not applicable for this type of publication.