USDA-ARS/
U.S. Wheat and Barley Scab Initiative
FY19 Annual Performance Progress Report - NCE
Due date: July 29, 2021

Cover Page

Principle Investigator (PI):	Kira Bowen
Institution:	Auburn University
E-mail:	BOWENKL@auburn.edu
Phone:	334-844-1953
Fiscal Year:	2019
USDA-ARS Agreement ID:	59-0206-6-008
USDA-ARS Agreement Title:	Integrated Strategies for Improved Management of FHB and DON in Soft Red Winter Wheat in Alabama
FY19 USDA-ARS Award Amount:	$ 20,362
Recipient Organization:	Auburn University Contracts and Grants Accounting Department (CGA) 208 M. White Smith Hall Auburn, AL 36849
DUNS Number:	066470972
EIN:	63-6000724
Recipient Identifying Number or Account Number:	361848-304504-2002
Project/Grant Reporting Period:	5/23/19 - 5/22/21
Reporting Period End Date:	5/22/2021

USWBSI Individual Project(s)

USWBSI Research Category*	Project Title	ARS Award Amount
MGMT	Integrated Strategies for Improved Management of FHB and DON in Soft Red Winter Wheat	$ 20,362
	FY19 Total ARS Award Amount	**$ 20,362**

Kira L. Bowen — July 26, 2021

Principal Investigator — Date

* MGMT – FHB Management
FST – Food Safety & Toxicology
R – Research
S – Service (DON Testing Lab)
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 Strategies for Improved Management of FHB and DON in Soft Red Winter Wheat*

1. **What are the major goals and objectives of the research project?**
   The major goals were: 1) to evaluate the integrated effects of fungicide and genetic resistance on Fusarium head blight (FHB) and DON in SRWW grown in AL; and 2) to evaluate the efficacy of Miravis Ace® to standard Prosaro® and Caramba® treatments for FHB and DON management.

2. **What was accomplished under these goals or objectives?** *(For each major goal/objective, address these three items below.)*

   a) **What were the major activities?**
   Yield data were collected and analyzed from three field trials (harvested June 2019). Three field trials were planted for the 2019-2020 wheat season with disease assessments done in April-May 2020 and yield samples evaluated for % Fusarium damage during summer. For the 2020-2021 season, two trials were planted and disease ratings done in the spring (Apr, May 2021). Each of these field trials included evaluations of fungicide and fungicide timing aimed at managing FHB; five of the trials included at least two wheat varieties for evaluating disease reactions.

   b) **What were the significant results?**
   The trials harvested in June 2019 had very low levels of any disease and no treatment differences were seen. In the 2019-2020 south Alabama field trial (harvested June 2020), the two application (MiravisAce fb tebuconazole) treatment significantly reduced FHB severity compared to all other treatments including single application treatments of MiravisAce at different timings; however, no differences were noted in yield. In a central AL field study harvested June 2020, all fungicide treatments (Prosaro, MiravisAce, MiravisAce fb tebuconazole, and Prosaro fb tebuconazole) significantly reduced incidence of Fusarium-damaged kernels (FDK) compared to no treatment. No differences in measured variables were noted between varieties in 2020 studies. Yields and some disease data (i.e., % FDK) are not yet compiled for the 2020-2021 field trials.
   Due to low disease, kernel samples from only non-treated plots were analyzed for DON in 2019 and 2020. None of these samples had substantial levels of DON.

   c) **List key outcomes or other achievements.**
   Disease observations made in spring 2020 indicates that MirvisAce is at least as effective as other products currently recommended for FHB management.

3. Was this research impacted by the COVID-19 pandemic (i.e. university shutdowns and/or restrictions, reduced or lack of support personnel, etc.)? If yes, please explain how this research was impacted or is continuing to be impacted.

Yes. Auburn University shut down in mid-March 2020 and all student help left the project. Permission for PI to travel to field sites was initially denied such that disease ratings were not done in a timely manner.

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

Three graduate students in PI's lab group and two undergraduate students have been trained to recognize and rate wheat diseases. In addition, Fusarium head blight samples have been shared with and explained to other students (outside of PIs lab group) in casual interactions.

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

Brief reports of results are shared with Alabama Experiment Station personnel where the work is performed. Thus, personnel have access to information when growers or others visit their unit. In addition, a presentation of results are shared with state agricultural commodity leaders at the annual "Commodity Organization Meeting."

Training of Next Generation Scientists

Instructions: Please answer the following questions as it pertains to the **FY19 award period (5/23/19 - 5/22/21)**. 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 FY19 award period?**
   ☒Yes ☐No
   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 FY19 award period?**
   ☐Yes ☒No
   If yes, how many? Click to enter number here.

3. **Have any post docs who worked for you during the FY19 award period and were supported by funding from your USWBSI grant taken faculty positions with universities?**
   ☐Yes ☒No
   If yes, how many? Click to enter number here.

4. **Have any post docs who worked for you during the FY19 award period and were supported by funding from your USWBSI grant gone on to take positions with private ag-related companies or federal agencies?**
   ☐Yes ☒No
   If yes, how many? Click to enter number here.

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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 **FY19 award period (5/23/19 - 5/22/21)**. 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	FHB Rating (0-9)	Year Released
Not applicable to this project.	Select Grain Class	Select what represents your most resistant check	Enter as text 0-9 rating	Select Year
Click here to enter text.	Select Grain Class	Select what represents your most resistant check	Enter as text 0-9 rating	Select Year
Click here to enter text.	Select Grain Class	Select what represents your most resistant check	Enter as text 0-9 rating	Select Year
Click here to enter text.	Select Grain Class	Select what represents your most resistant check	Enter as text 0-9 rating	Select Year
Click here to enter text.	Select Grain Class	Select what represents your most resistant check	Enter as text 0-9 rating	Select Year
Click here to enter text.	Select Grain Class	Select what represents your most resistant check	Enter as text 0-9 rating	Select Year
Click here to enter text.	Select Grain Class	Select what represents your most resistant check	Enter as text 0-9 rating	Select Year
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Click here to enter text.	Select Grain Class	Select what represents your most resistant check	Enter as text 0-9 rating	Select Year
Click here to enter text.	Select Grain Class	Select what represents your most resistant check	Enter as text 0-9 rating	Select Year

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

Publications, Conference Papers, and Presentations

Instructions: Refer to the FPR_Instructions for detailed more instructions for listing publications/presentations about your work that resulted from all of the projects included in the FY19 grant award. Only citations for publications published (submitted or accepted) or presentations presented during the **award period (5/23/19 - 5/22/21**) should be included. If you did not publish/submit or present anything, state 'Nothing to Report' directly above the Journal publications section.

NOTE: Directly below each citation, you **must** indicate the Status (i.e. published, submitted, etc.) and whether acknowledgement of Federal support was indicated in the publication/ presentation. See example below for a poster presentation with an abstract:

Z.J. Winn, R. Acharya, J. Lyerly, G. Brown-Guedira, C. Cowger, C. Griffey, J. Fitzgerald, R.E. Mason and J.P. Murphy. 2020. "Mapping of Fusarium Head Blight Resistance in NC13-20076 Soft Red Winter Wheat." In: S. Canty, A. Hoffstetter, and R. Dill-Macky (Eds.), *Proceedings of the 2020 National Fusarium Head Blight Forum (*p. 12.), Virtual; December 7-11. Online: https://scabusa.org/pdfs/NFHBF20_Proceedings.pdf.
Status: Abstract Published and Poster Presented
Acknowledgement of Federal Support: YES (Abstract and Poster)

Journal publications.

Nothing to report.

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

Nothing to report.

Other publications, conference papers and presentations.

Luis, J. M., Ng, S. J., Bergstrom, G., Bissonnette, K., Bowen, K., and 24 others. 2020. Fusarium head blight management coordinated project: Integrated management trials 2018-2020. Proc. Nat. Fusarium Forum, pp. 38-43.
Status: Poster presented and paper published.
Acknowledgement of Federal Support: Yes.

Luis, J. M., Ng, S. J., Bergstrom, G., Bissonnette, K., Bowen, K., and 24 others. 2020. Fusarium head blight coordinated project: uniform fungicide trials 2018-2020. Proc. Nat. Fusarium Forum, pp. 44-48.
Status: Poster presented and paper published.
Acknowledgement of Federal Support: Yes.

Paul, P.A., S. J. Ng, G. Bergstrom, K. Bissonnette, K. Bowen, et al. 2019. Fusarium head blight management coordinated project: integrated management trials 2018-2019. Proc. National Fusarium Head Blight Forum, pp. 20-28.
Status: Poster presented and paper published.
Acknowledgement of Federal Support: Yes

Bowen, K.L. 2019. Fusarium head blight management in Alabama. Proc. National Fusarium Head Blight Forum, p. 3.
Status: Poster presented and paper published.
Acknowledgement of Federal Support: Yes

Paul, P.A., S. J. Ng, G. Bergstrom, K. Bissonnette, K. Bowen, et al. 2019. Fusarium head blight management coordinated project: uniform fungicide trials 2018-2019. Proc. National Fusarium Head Blight Forum, pp. 25-29.
Status: Poster presented and paper published.
Acknowledgement of Federal Support: Yes

Bhimire, B., M. Mergoum, A. E. Glenn, K. L. Bowen, J. Youmans, S. Sapkota, A. D. Martinez, and J. W. Buck. 2019. Understanding the genetic diversity of *Fusarium* species causing Fusarium head blight (FHB) of wheat in Georgia. Proc. National Fusarium Head Blight Forum, p. 712.
Status: Poster presented and abstract published.
Acknowledgement of Federal Support: No.

Salgado, J. D., G. C. Bergstrom, C. A. Bradley, K. L. Bowen, et al. 2019. Effects of two treatment fungicide programs on grain yield and quality of Fusarium head blight-affected wheat. Phytopathology 109:S2.65.
Status: Poster presented and abstract published.
Acknowledgement of Federal Support: on poster, not abstract.