USDA-ARS
U.S. Wheat and Barley Scab Initiative
FY20 Annual Performance Progress Report
Due date: July 29, 2021

Cover Page

Principle Investigator (PI):	Guy 'Boyd' Padgett
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Fiscal Year:	2020
USDA-ARS Agreement ID:	59-0206-0-159
USDA-ARS Agreement Title:	Evaluating Fungicides for Managing Fusarium Head Blight in Louisiana
FY20 USDA-ARS Award Amount:	$ 23,100
Recipient Organization:	Louisiana State University Agricultural Center Office of Accounting Services Baton Rouge, LA 70803
DUNS Number:	783201833
EIN:	72-6000848
Recipient Identifying Number or Account Number:	AWD-003150
Project/Grant Reporting Period:	5/15/20 - 5/14/21
Reporting Period End Date:	5/14/2021

USWBSI Individual Project(s)

USWBSI Research Category*	Project Title	ARS Award Amount
MGMT	Evaluating Fungicides for Managing Fusarium Head Blight in Louisiana	$ 23,100
	FY20 Total ARS Award Amount	**$ 23,100**

Boyd Padgett

7-23-21

Principal Investigator Date

* MGMT – FHB Management
FST – Food Safety & Toxicology
R- Research
S – Service (DON Testing Labs)
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: *Evaluating Fungicides for Managing Fusarium Head Blight in Louisiana*

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

1) Evaluate the integrated effects of fungicide treatment and genetic resistance on FHB and DON in all major grain classes, with emphasis on a new fungicide, Miravis Ace®.
2) Compare the efficacy of Miravis Ace when applied at early heading or at anthesis to that of standard anthesis application of Prosaro® or Caramba®.

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?

Trials were established on three LSU AgCenter experiment stations: (Macon Ridge near Winnsboro, Dean Lee near Alexandria, and Central Stations near Baton Rouge). Two trials were established at each location to address the two objectives listed previously. Trials were inoculated (1 gm/sq ft.) with *Fusarium graminearum* infested corn seed. The trials at Macon Ridge were misted. To address objective one, three varieties (Delta Grow 3500: susceptible, Agrimaxx 492: moderate resistant, Liberty: resistant) were planted. Four fungicide treatments and two non-treated consistent with the protocol outlined in the integrated management coordinated project were implemented. Additional trials were planted at Macon Ridge, Dean Lee, and Central Stations to address objective two. Delta Grow 3500 was planted at Macon Ridge and Dean Lee and FFR 520 was planted at Central Stations. Treatments were applied consistent with the uniform fungicide coordinated project. Scab data was taken according to the coordinated project. Trials were harvested from Macon Ridge and Dean Lee. Harvesting began on May 31th at Dean Lee; however, a combine breakdown and excessive rainfall caused a delay in harvesting (resumed June 10th). The Baton Rouge location could not be harvested due to a late freeze and excessive late season rainfall.

b) What were the significant results?

Objective one: Central Stations: Scab incidence and severity were low at Central Stations. Delta Grow 3500 treated with Miravis Ace applied at flowering (1.1 scab index) or Miravis Ace at flowering followed by an application of tebuconazole four days later (1.7) had less scab (P=0.1) than the non-treated (4.1), Miravis Ace applied at early heading, or Prosaro applied at flowering (3.5). Scab severity did not differ (P=0.1) among treatments in the Agrimaxx 492 or Liberty varieties. Plots were not harvested due to excessive rainfall.

Macon Ridge: Fungicide treatments (0.8-7.6 scab index) on Delta Grow 3500 were effective for suppressing scab compared to the non-treated (21.3) (P=0.1). There were

no differences (P=0.1) in yield among treatments. Scab severity in Agrimaxx 492 was lower (P=0.1) than the non-treated in all fungicide treatment except Prosaro applied at flowering. There were no differences in yield among treatments. Scab severity did not differ among treatments in Liberty. However, yield was higher than the non-treated in the wheat treated with Prosaro at flowering (P=0.1).

Dean Lee: Scab severity in Delta Grow 3500 was less (P=0.1) than the non-treated in all fungicide treatments except Miravis Ace applied at early heading. Scab severity in Agrimaxx 492 did not differ among treatments (P=0.1). Severity in Liberty was less (P=0.1) than the non-treated for all fungicide treatments except Miravis Ace applied at early heading. Yields for treatments were not reliable because harvesting was interrupted due to equipment breakdown and excessive rainfall.

Summary: Fungicides applied at flowering were most effective for managing scab in Delta Grow (susceptible). Yields for all but one treatment did not differ among treatments (P=0.1) at the Macon Ridge location.

Objective two (Uniform fungicide test): The test at Central Stations was lost due to freeze damage and excessive rainfall.

Dean Lee: Scab severity was less (P=0.1) than the non-treated for all fungicide treatments except for Miravis Ace applied twice or at early heading. Treatment yields were not reliable due to equipment breakdown and excessive rainfall which interrupted harvesting.

Macon Ridge: All fungicide treatments has less scab (P=0.1) than the non-treated. Scab index ranged from 31.55 to 11.75. However, this did not result in a preservation of yield.

c) List key outcomes or other achievements.

None to report

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.

No

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

Some results were presented at the Mid-South Association of Wheat Scientists annual meeting and Louisiana Crops Newsletter. Quality data is being summarized and analyzed. Results will be presented at future events.

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

Oral presentation and Louisiana Crops Newsletter September 2020, v. 10, no. 8

Training of Next Generation Scientists

Instructions: Please answer the following questions as it pertains to the FY20 award period (5/15/20 - 5/14/21). 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 FY20 award period?**
   ☐Yes ☒No
   If yes, how many? Click to enter number here.

2. **Did any graduate students in your research program supported by funding from your USWBSI grant earn their Ph.D. degree during the FY20 award period?**
   ☐Yes ☒No
   If yes, how many? Click to enter number here.

3. **Have any post docs who worked for you during the FY20 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 FY20 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.

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 FY20 award period (5/15/20 - 5/14/21). 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
N/A	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
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 PR_Instructions for detailed more instructions for listing publications/presentations about your work that resulted from all of the projects included in the FY20 grant award. Only citations for publications published (submitted or accepted) or presentations presented during the **award period (5/15/20 - 5/14/21**) 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:

Winn, Z.J., Acharya, R., Lyerly, J., Brown-Guedira, G., Cowger, C., Griffey, C., Fitzgerald, J., Mason R.E., and Murphy, J.P. (2020, Dec 7-11). Mapping of Fusarium Head Blight Resistance in NC13-20076 Soft Red Winter Wheat (p. 12). In: Canty, S., Hoffstetter, A. and Dill-Macky, R. (Eds.), *Proceedings of the 2020 National Fusarium Head Blight Forum*. 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.

Presentation at 2021 Mid-South Association of Wheat and Feed Grains Scientists annual meeting. Evaluating fungicides, application timing, and genetic resistance for managing Fusarium head blight. June 28-29, Bost Extension Center, Mississippi State University, Starkville, MS.
Status: Presented
Acknowledgement of Federal Support: Yes

Harrison, S.A., Price, P., Padgett, G.B., Areceneaux, K., and Hardling, Allyson. 2020. Fusarium head blight of wheat (scab) in Louisiana. Louisiana Crops Newsletter v. 10, no. 8 (online).
Status: Published
Acknowledgement of Federal Funding Support: Yes