

USDA-ARS | U.S. Wheat and Barley Scab Initiative
FY21 FINAL Performance Progress Report

Due date: July 26, 2023

Cover Page

USDA-ARS Agreement ID:	59-0206-0-159
USDA-ARS Agreement Title:	Evaluating Fungicides for Managing Fusarium Head Blight in Louisiana
Principle Investigator (PI):	Guy 'Boyd' Padgett
Institution:	Louisiana State University Agricultural Center
Institution UEI:	UF3LV6W2W6K9
Fiscal Year:	2021
FY21 USDA-ARS Award Amount:	\$23,100
PI Mailing Address:	Louisiana State University Agricultural Center, Dean Lee Research and Extension Center 8105 Tom Bowman Drive, Alexandria, LA 71302
PI E-mail:	bpadgett@agcenter.lsu.edu
PI Phone:	318-614-4354
Period of Performance:	5/15/21 - 5/14/23
Reporting Period End Date:	5/14/2023

USWBSI Individual Project(s)

USWBSI Research Category*	Project Title	ARS Award Amount
MGMT-IM	Evaluating Fungicides for Managing Fusarium Head Blight in Louisiana	\$23,100
FY21 Total ARS Award Amount		\$23,100

I am submitting this report as a: FINAL Report

I certify to the best of my knowledge and belief that this report is correct and complete for performance of activities for the purposes set forth in the award documents.

7-18-23

Principal Investigator Signature

Date Report Submitted

† BAR-CP – Barley Coordinated Project
 DUR-CP – Durum Coordinated Project
 EC-HQ – Executive Committee-Headquarters
 FST-R – Food Safety & Toxicology (Research)
 FST-S – Food Safety & Toxicology (Service)
 GDER – Gene Discovery & Engineering Resistance
 HWW-CP – Hard Winter Wheat Coordinated Project

MGMT – FHB Management
 MGMT-IM – FHB Management – Integrated Management Coordinated Project
 PBG – Pathogen Biology & Genetics
 TSCI – Transformational Science
 VDHR – Variety Development & Uniform Nurseries
 NWW – Northern Soft Winter Wheat Region
 SPR – Spring Wheat Region
 SWW – Southern Soft Red Winter Wheat Region

Project 1: Evaluating Fungicides for Managing Fusarium Head Blight in Louisiana

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

Objective 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[®]. Sphaerex[®] and Prosaro Pro[®] were added in tests initiated in 2021.

Objective 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[®]. Sphaerex[®] and Prosaro Pro[®] were added in tests initiated in 2021.

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?

Seed quality assessment % FDK (Fusarium-damaged kernels), seed quality and DON (ppm) analysis were completed in September 2022 on trials conducted during 2021-2022. Treatments were consistent with the FHB Coordinated Project. Treatment means were compared (LSD P=0.1)

b) What were the significant results?

Results from trials at Dean Lee Research Station near Alexandria:

Objective 1: General Screening (cv. Blanton): % FDK ranged from 1.0-10.8. Percent FDK was highest in the non-treated. Percent FDK was lower in all fungicide treatments had lower (except Caramba and Prosaro 8.2 fl oz/A) applied once didn't differ from the non-treated. Seed quality was higher than the non-treated in all fungicide treatments except Caramba and Prosaro (8.2 fl oz/A). DON was highest in the non-treated but was lowered by fungicide treatments applied once (except Prosaro (6.5 fl oz/A, Caramba, Sphaerex).

Objective 2: Variety x Fungicide: Wheat varieties (scab resistance rating) were Blanton (susceptible), AgriMaxx 492 (moderately resistant), and Delta Grow 1800 (resistant).

Blanton: When comparing varieties, % FHB and DON were most severe in Blanton. FHB was lower than the non-treated in the fungicide treatments. Seed quality was improved over the non-treated in wheat treated with Prosaro (8.2 fl oz/A) or Miravis Ace, but not in the Prosaro Pro or Sphaerex treatments. DON was less than the non-treated in all fungicide treatments.

AgriMaxx 492: Percent FHB was less than the non-treated in wheat treated with Prosaro Pro and Sphaerex. Seed quality was improved by all fungicide treatments relative to the non-treated. DON was less than the non-treated in all fungicide treatments.

Delta Grow 1800: There were no differences among treatments in FDK and seed quality. DON (ppm) was less in than the non-treated in all fungicide treatments (except Prosaro Pro).

Results from trials at Macon Ridge Research Station near Winnsboro:

General Screening: DON varied among treatments (14.0 – 4.8 ppm). Wheat treated with Miravis Ace or Miravis Ace followed by Prosaro Pro or Sphaerex had less DON than the non-treated.

Variety x Fungicide: Fungicides did not result in less DON when compared to non-treated in any variety.

Results from trials at Doyle Chambers (Ben Hur) Research Station near Baton Rouge:

Percent FDK was less than the non-treated wheat in the Miravis Ace, Prosaro (8.2 fl oz/A), or Miravis Ace followed by Sphaerek, or tebuconazole. Seed quality was not better than the non-treated for any single fungicide application treatments (except Miravis Ace). Seed quality in Miravis Ace followed by tebuconazole or Miravis Ace followed by Prosaro Pro was higher than the non-treated. DON was lower than the non-treated for all fungicide treatments (except Caramba and Sphaerek).

c) List key outcomes or other achievements.

Fungicides were most effective in the susceptible variety for lower FDK and lower DON when compared to the non-treated. Genetic resistance was effective for less FDK and DON.

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

Agent Training (November 30, 2022), lecture Plant Disease Management, See #4 below

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

Information has been disseminated at field days (Wheat/Oat Field Day: 4/20/23), pesticide recertification, agent training, departmental seminar, LA Soybean and Feed Grains Research and Promotion Board meeting, and parish production meetings.

Publications, Conference Papers, and Presentations

Please include a listing of all your publications/presentations about your FHB work that were a result of funding from your FY21 grant award. Only citations for publications published (submitted or accepted) or presentations presented during the **award period** should be included.

Did you publish/submit or present anything during this award period?

- Yes, I've included the citation reference in listing(s) below.
 No, I have nothing to report.

Journal publications as a result of FY21 award

List peer-reviewed articles or papers appearing in scientific, technical, or professional journals. Include any peer-reviewed publication in the periodically published proceedings of a scientific society, a conference, or the like.

Identify for each publication: Author(s); title; journal; volume; year; page numbers; status of publication (published [include DOI#]; accepted, awaiting publication; submitted, under review; other); acknowledgement of federal support (yes/no).

Books or other non-periodical, one-time publications as a result of FY21 award

Report any book, monograph, dissertation, abstract, or the like published as or in a separate publication, rather than a periodical or series. Include any significant publication in the proceedings of a one-time conference or in the report of a one-time study, commission, or the like.

Identify for each one-time publication: Author(s); title; editor; title of collection, if applicable; bibliographic information; year; type of publication (book, thesis, or dissertation, other); status of publication (published; accepted, awaiting publication; submitted, under review; other); acknowledgement of federal support (yes/no).

Other publications, conference papers and presentations as a result of FY21 award

Identify any other publications, conference papers and/or presentations not reported above. Specify the status of the publication.