

FY22 Performance Progress Report

Due date: July 26, 2023

Cover Page

USDA-ARS Agreement ID:	59-0206-2-133
USDA-ARS Agreement Title:	Using Genetic Resistance and Fungicides for Managing Fusarium Head Blight in Louisiana
Principle Investigator (PI):	Guy Padgett
Institution:	Louisiana State University Agricultural Center
Institution UEI:	UF3LV6W2W6K9
Fiscal Year:	2022
FY22 USDA-ARS Award Amount:	\$24,225
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:	May 1, 2022 – April 30, 2026
Reporting Period End Date:	April 30, 2023

USWBSI Individual Project(s)

USWBSI Research Category*	Project Title	ARS Award Amount
MGMT IM-CP	Evaluating fungicides for managing Fusarium head blight in Louisiana	\$24,225
FY22 Total ARS Award Amount		\$24,225

I am submitting this report as an: Annual 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.

Principal Investigator Signature

7-18-23

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 new combination fungicides, Prosaro Pro and Sphaerex.

Objective 2. Compare the efficacy of Prosaro Pro and Sphaerex to that of Prosaro, and Miravis Ace. Trial establishment, plots dimensions, and general management will be as described under Obj. 1. Plots of a single susceptible cultivar will be planted in a randomized complete block, with 4-6 replicate blocks, and subjected to at least nine fungicide treatments (Table 2).

Table 2. The following fungicide treatments will be randomly assigned to experimental units (wheat)

Trt ^a	Product	Rate/Acre (fl oz)	Timing
1	Untreated check
2	Prosaro	6.5	Feekes 10.5.1 (early anthesis)
3	Caramba	13.5	Feekes 10.5.1 (early anthesis)
4	Miravis Ace	13.7	Feekes 10.5.1 (early anthesis)
5	Prosaro Pro	10.3	Feekes 10.5.1 (early anthesis)
6	Sphaerex	7.3	Feekes 10.5.1 (early anthesis)
7	Miravis Ace fb Prosaro Pro	13.7/10.3	Early anthesis/4-6 days after early anthesis
8	Miravis Ace fb Sphaerex	13.7/7.3	Early anthesis/4-6 days after early anthesis
9	Miravis Ace fb Tebuconazole	13.7/4	Early anthesis/4-6 days after early anthesis

^aAll treatments will be applied with NIS @ 0.125 v/v

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 (cv. Plantation) were established on three LSU AgCenter experiment stations: (Macon Ridge near Winnsboro, Dean Lee near Alexandria, and Doyle Chambers Central Research Station near Baton Rouge). Trials were conducted at Macon Ridge and Dean Lee to address objective one. Three varieties (Plantation: susceptible, Go Wheat 6000: moderate resistant, Delta Grow 1800: resistant) were planted in fall of 2022. Four fungicide treatments and two non-treated consistent with the protocol outlined in the integrated management coordinated project were implemented.

Trials were conducted using Plantation at the three locations to address objective two. An additional uniform fungicide trial (cv. Blanton: scab susceptible) was conducted at Doyle Chambers experiment station. Treatments were applied consistent with the uniform fungicide coordinated project. Trials were inoculated (1 gm/sq ft) with *Fusarium graminearum* infested corn seed prior to heading. The trials at Macon Ridge were misted. Scab data was taken and processed according to the coordinated project. The fungicide trials planted at Dean Lee were lost due to planting error and late freeze in March. However, the variety FFR520 was used at Dean Lee to address objective two, but uneven head

emergence made it difficult to target application timing. Scab incidence and severity was low (or didn't develop) at all locations. Where possible, scab ratings and yields for treatments have been analyzed. Grain samples have been sent for DON analysis.

b) What were the significant results?

Doyle Chambers:

Blanton trial: Yields were higher ($P=0.1$) than the non-treated in all treatments except Prosaro (6.2 fl oz/A). Scab index values ranged from 2.21 to 0.32 ppm. Index values ($P=0.1$) were less than the non-treated in all fungicide treated wheat.

Plantation trial: Yields did not differ among treatments; however, the scab index in wheat treated with Miravis Ace followed by tebuconazole was less than the non-treated.

Dean Lee: Some of the heads were damaged by the late March freeze. Visual ratings were not made. Leaf rust epidemics did develop late-season. Rust was less ($P=0.1$) than the non-treated in all fungicide treated wheat. Yields were higher ($P=0.1$) than the non-treated in some fungicide treatments. Yields did not differ from the non-treated in wheat treated with Sphaerex, Prosaro, Prosaro Pro, Caramba, and Miravis Ace followed by tebuconazole.

Macon Ridge:

Fungicide/Variety trial: Yields did not differ ($P=0.1$) among treatments within varieties. Percent Fusarium damaged kernels (FDK) varied among varieties and fungicide treatments. Percent FDK in the non-treated did not differ across varieties and within varieties in most fungicide treatments relative to the non-treated. This may have been due to freeze injury.

Uniform fungicide trial: Yields were higher than the non-treated for some fungicide treatments, but not wheat treated with Prosaro, Caramba, Miravis Ace, or Sphaerex. Percent FDK did not differ among treatments. Freeze injury may have resulted in inconsistent results.

c) List key outcomes or other achievements.

Results from the trials conducted at the Doyle Chambers experience station. Relative to non-treated, yields were preserved and %FDK was lower in wheat treated with fungicides. Results from the other two locations were inconclusive.

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

None to date.

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

None to date, but this information will be presented at local and regional meetings, as well as newsletters.

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 FY22 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 May 1, 2022 – April 30, 2023?

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

Journal publications as a result of FY22 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 FY22 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 FY22 award

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