

FY21 Performance Progress Report

Due date: July 26, 2022

Cover Page

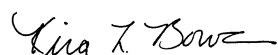
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Fiscal Year:	2021
USDA-ARS Agreement ID:	59-0206-0-153
USDA-ARS Agreement Title:	Integrated Strategies for Improved Management of FHB and DON in Soft Red Winter Wheat in Alabama
FY20 USDA-ARS Award Amount:	\$18,419
Recipient Organization:	Auburn University Department of Entomology and Plant Pathology 209 Rouse Bldg. Auburn, AL 36849
DUNS Number:	066470972
EIN:	63-6000724
Recipient Identifying Number or Account Number, if any:	204819
Project/Grant Period:	5/23/21 - 5/22/23
Reporting Period End Date:	5/22/2022

USWBSI Individual Project(s)

USWBSI Research Category*	Project Title	ARS Award Amount
MGMT-IM	Integrated Strategies for Improved Management of FHB and DON in Soft Red Winter Wheat in Alabama	\$18,419
FY21 Total ARS Award Amount		\$18,419

I am submitting this report as an: Annual Report 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.



Principal Investigator Signature

22 July 2022 _____
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: Integrated Strategies for Improved Management of FHB and DON in Soft Red Winter Wheat in Alabama

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

Major goals of this project are:

1. To develop integrated management strategies for FHB and mycotoxins that are robust to conditions experienced in production fields of wheat.
2. Help develop and validate the next generation of management and mitigation tools for FHB and mycotoxin control.

Objectives are:

1. To evaluate the integrated effects of fungicide and genetic resistance on FHB and DON in soft red winter wheat (SRWW) grown in AL and
2. To evaluate the efficacy of Miravis Ace, applied at varying times, 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?

During summer and fall 2021, yield data were collected and analyzed, and harvest samples were tested for DON from winter wheat field studies planted in the fall of 2020. Field research was done at two locations—planted in fall 2021 with disease and yield assessment done in spring and through summer. Fungicides were applied to plots of soft red winter wheat according to IM-MGMT guidelines. At PBU (= east central AL, 32.4993, -85.8915) and GC (= south AL, 30.542, -87.882) three and two wheat varieties, respectively, were included. The focus of these studies was to compare recently introduced fungicides, Sphaerex and ProsaroPro, to established products, particularly MiravisAce. Disease was rated at all locations, and head samples were collected for determining the scab index. Yield data are not complete; samples from harvest will be evaluated for proportion of Fusarium damaged kernels.

b) What were the significant results?

In spring of 2021, treatments focused on effectiveness of MiravisAce when applied at different times relative to anthesis; 2021-2022 wheat studies compared MiravisAce to Sphaerex and ProsaroPro. Yields were assessed from 2021 treatments during grant period.

At the southern location (GC), all fungicide treatments reduced FDK % and DON compared to controls; greatest reductions in DON were noted with the two-fungicide application programs, delayed application of MiravisAce, and the Sphaerex treatment (40 to 70% lower than in controls). Test weights and yield were also improved with all fungicide programs at GC, and greatest yield gains were seen with

two-application programs as well the MiravisAce at anthesis and the delayed MiravisAce application.

At the central location (PBU) in spring 2021, the MR variety (AGS 3030) had somewhat lower DON than the S variety (SS 5550); an experimental variety from UGA (GA 09129) had even lower DON. No other measured variables differed among varieties.

MiravisAce treatments reduced scab index but not FDK %, and only a two-fungicide application program reduced DON compared to controls at PBU.

Through May 2022, disease data have been collected from two sites (GC and PBU). At GC where all fungicides were applied at anthesis, the scab index differed among fungicide treatments; Sphaerex and ProsaroPro allowed lower indices than noted in control plots or with MiravisAce. At PBU, there were no significant differences in scab indices among fungicide treatments, but each of the products numerically reduced the scab index. Yield data are not complete.

c) List key outcomes or other achievements.

There is an indication that the recently introduced fungicidal products, Sphaerex and ProsaroPro, have good efficacy against scab.

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

Graduate students have been trained to recognize and rate disease levels in wheat.

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

A summary report is provided to station personnel and results from all locations at which work was done is shared with growers at a commodity group meeting. Results are also discussed with extension specialists on campus.

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 grant 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 grant 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 grant award

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

Bowen, K. L. 2022. Fusarium Head Blight management in Alabama in 2021. So. Div APS (to be published in Phytopathology from March meeting).