USDA-ARS | U.S. Wheat and Barley Scab Initiative

FY22 Performance Progress Report

Due date: July 26, 2023

Cover Page

USDA-ARS Agreement ID:	59-0206-2-116
USDA-ARS Agreement Title:	Integrated Management of Fusarium Head Blight (FHB) in Minnesota
Principle Investigator (PI):	Ruth Dill-Macky
Institution:	University of Minnesota
Institution UEI:	KABJZBBJ4B54
Fiscal Year:	2022
FY22 USDA-ARS Award Amount:	$36,485
PI Mailing Address:	University of Minnesota, Department of Plant Pathology 495 Borlaug Hall, 1991 Upper Buford Circle St. Paul, MN 55108
PI E-mail:	ruthdm@umn.edu
PI Phone:	612-625-2227
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	FHB Integrated Management: Minnesota Component of the Coordinated Project	$36,485
	FY22 Total ARS Award Amount	$36,485

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.

Ruth Dill-Macky

Principal Investigator Signature

7/25/2023

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: FHB Integrated Management: Minnesota Component of the Coordinated Project

---

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

This proposal was part of the larger FHB management coordinated project, established with the goal of examining the efficacy of two recently registered fungicides; Prosaro PRO [Bayer CropScience] and Sphaerex [BASF] being promoted for the control of FHB. Information on the efficacy of these two new fungicides provides additional and effective options for the control of FHB and/or on the reduction of *Fusarium*-associated mycotoxins in small grain cereals. The combination of active ingredients, and especially the inclusion of the succinase dehydrogenase inhibitor in Prosaro PRO, would suggest that these fungicides are at a reduced risk of developing fungicide resistance, given that single ingredient DMI fungicides are those that are most widely used for FHB control. Given that the cost of these new fungicides is anticipated to be higher than the current industry standards for FHB (Prosaro and Caramba) data from the proposed project should also provide valuable information for producers to judge the efficacy of these new products and determine a cost/benefit analysis of their use in their production system(s).

The specific objectives are to:

1) Evaluate the integrated effects of fungicide treatment and genetic resistance on FHB and DON in all major grain classes, with emphasis on the new combination fungicides, Prosaro PRO and Sphearex
2) Compare the efficacy of Prosaro PRO and Sphaerex to that of the current industry standards; Prosaro, Caramba and Miravis Ace
3) Generate data to further quantify the economic benefit of FHB and DON management programs
4) Generate data to validate and advance the development of FHB risk prediction models

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?

In Minnesota we undertook the integrated management trial (IM) and the uniform fungicide trials (UFT) as outlined in the standard protocol for hard red spring wheat (HRSW), with the field experiments to be established at two locations, Saint Paul and Crookston.

b) What were the significant results?

The data generated in 2022 has been compiled and submitted to the project coordinator. The data demonstrated that both Miravis Ace and Sphaerex are effective in in the control of FHB and DON in hard red spring wheat.

c) List key outcomes or other achievements.

The results of these experiments have allowed us to determine that Prosaro PRO and Sphaerex are effective against FHB and DON but they were not consistently better than

the Prosaro, Caramba, or Miravis Ace. This has provided producers with additional information when deciding how best to manage FHB. Summary results from these studies were published as part of a collaborative/national publication on integrated management guidelines for FHB and DON at the 2022 FHB forum.

3. **What opportunities for training and professional development has the project provided?**
   No graduate students worked on this project. Undergraduate student researchers utilized this project to gain experience in field-based research techniques.

4. **How have the results been disseminated to communities of interest?**
   The results of these studies will be published as part of a national publication on integrated management guidelines for FHB and DON. Regionally, results have be delivered to growers, dealerships, county extension educators and others in the wheat and barley production industries through extension programs. In addition, data from these trials will be used to advance the development and validations of FHB and DON risk assessment models.

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.