

FY21 Performance Progress Report

Due date: July 26, 2023

Cover Page

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| USDA-ARS Agreement ID: | 59-0206-0-139 |
| USDA-ARS Agreement Title: | Reducing Scab and Vomitoxin in Malting Barley in the Mid-Atlantic |
| Principle Investigator (PI): | Alyssa Collins |
| Institution: | Pennsylvania State University |
| Institution UEI: | NPM2J7MSCF61 |
| Fiscal Year: | 2021 |
| FY21 USDA-ARS Award Amount: | \$20,236 |
| PI Mailing Address: | Pennsylvania State University, PSU Southeast Ag Research & Extension Center 1446 Auction Rd, Manheim, PA 17545 |
| PI E-mail: | collins@psu.edu |
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| Period of Performance: | 6/1/21 - 5/31/23 |
| Reporting Period End Date: | 5/31/2024 |

USWBSI Individual Project(s)

| USWBSI Research Category [†] | Project Title | ARS Award Amount |
|---------------------------------------|---|------------------|
| MGMT-IM | Integrated Management of Malting Barley in Pennsylvania | \$20,236 |
| FY21 Total ARS Award Amount | | \$20,236 |

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

7/26/23

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: Integrated Management of Malting Barley in Pennsylvania

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

The objectives of this project in alignment with the USWBSI Action Plan are to:

- Develop integrated management strategies for FHB and mycotoxins that are robust to conditions experienced in MidAtlantic production fields of barley by trialing fungicide chemistries, timing, and genetic resistance.
- Help develop and validate the next generation of management and mitigation tools for FHB and mycotoxin control by providing information regarding field scale conditions and disease development.
- Enhance communication and end user education/outreach regarding best management practices for production of high-quality malting barley

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?

Malting barley integrated management (IM) trials and uniform fungicide trials (UFT) were established in two production regions of Pennsylvania (the Penn State Southeast Agricultural Research & Extension Center in the south and Russell E. Larson Agricultural Research Center in the central region).

Following the coordinated project established protocols, fungicide products and application timings were tested on three mid-Atlantic adapted malting barley varieties ranging susceptible to moderately FHB resistant (Calypso, Thoroughbred, Violetta). The trials were harvested, processed, subsampled and evaluated for FDK and DON

This and previous work have been used by the Penn State Agronomy Extension Team in delivering education focused on quality malting barley production for growers as well as maltsters and brewers/distillers throughout the reporting period.

b) What were the significant results?

Due to low rainfall during grain fill and ripening, little Fusarium head blight developed in the trials at both sites. Barley grain and straw quality were good. This does allow us to discuss the costs and benefits of fungicide programs in years of low disease pressure so that farmers and consultants can make economical decisions informed by field results.

c) List key outcomes or other achievements.

In this reporting period, we were able to invite stakeholders into the field to tour plots with us and discuss approaches to FHB control. The PIs are now regularly contacted by a group of high-intensity wheat and barley producers to lead annual update conversations on this and other grain quality issues.

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

While students were not directly supported on this award, this project has provided the opportunity for four undergraduate students at two locations to participate in study plot planting, evaluation, harvest, and sample analysis. Postdoctoral researchers also participated in data collection and analysis.

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

From May 2022 through May 2023, project PIs have presented the results of this work at several extension events and invited agricultural industry meetings, reaching over 500 individuals. Updated commentary was provided continuously through ScabSmart during the critical small grain disease management period. PIs also wrote several articles (listed below) as part of Penn State Extension's Field Crop News, which is received by over 10,000 currently signed up to receive information Penn State Extension.

High Fusarium Head Scab Infection Risk

Keep Your Eye on Fusarium Head Blight Risk in Pennsylvania

Home Stretch: Evaluating Your Small Grain Crops

Scouting Small Grains Diseases for Improved Fungicide Decision Making

Heads Up, Barley Heads Are Out!

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).

Murillo-Williams, A., Borrelli, K., Esker, P., Collins, A. 2022. Grain Quality is Key for Malting Barley Production and Marketing. Penn State Extension Factsheet. Published. Yes.

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.

'Scouting Small Grains Diseases for Improved Fungicide Decision Making', Invited Presentation, January 11, 2023, 20th Ontario Certified Crop Advisor Conference, London, ON, Canada.