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:	59-0206-0-190
USDA-ARS Agreement Title:	Diagnostic Testing Services for Deoxynivalenol in the Eastern U.S.
Principle Investigator (PI):	David Schmale
Institution:	Virginia Tech.
Institution UEI:	QDE5UHE5XD16
Fiscal Year:	2021
FY21 USDA-ARS Award Amount:	$79,434
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Period of Performance:	6/7/21 - 6/6/23
Reporting Period End Date:	6/6/2023

USWBSI Individual Project(s)

USWBSI Research Category*	Project Title	ARS Award Amount
FST-S	Diagnostic Testing Services for Deoxynivalenol in the Eastern U.S.	$79,434
	FY21 Total ARS Award Amount	$79,434

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.

Principal Investigator Signature

July 24, 2023

Date Report Submitted

ǂ 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: Diagnostic Testing Services for Deoxynivalenol in the Eastern U.S.

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1. **What are the major goals and objectives of the research project?**
   The overall goals of our project were to (1) provide diagnostic testing services for DON for wheat and barley samples associated with USWBSI-supported research projects in the eastern U.S. and (2) reduce DON contamination in wheat and 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?**
   In FY22, DON data was delivered for 4,929 wheat and barley samples from the following USWBSI investigators: Bowen (80 samples), Boyles (522 samples), Darby (110 samples), Glover (1,520 samples), Koehler (245 samples), Santantonio (1,400 samples), Toomajian (752) and Wegulo (300 samples). The testing number does NOT include controls, checks, and re-runs. Most of the samples tested in FY22 were 100g kernel lots from FHB field trials, but some were smaller lots from laboratory experiments. Extraction, clean-up, and quantification of DON were conducted following standard protocols using a GC/MS. Research associate Niki McMaster and PI David Schmale attended the 2022 USWBSI meeting in Florida.

   b) **What were the significant results?**
   The proposed project provided essential DON testing services for the USWBSI, and supported the only USWBSI-associated DON testing lab in the eastern U.S. Many of the wheat and barley lines had not been tested previously for mycotoxins.

   c) **List key outcomes or other achievements.**
   The research has contributed to the development and release of new FHB-resistant wheat and barley varieties and has ensured rigorous testing of both new and historical wheat and barley varieties for mycotoxin contamination. The Schmale Lab at Virginia Tech continues to be committed to the long-term management of a successful and productive mycotoxin testing lab for the USWBSI. DON testing services were coordinated, supported, and managed by research associate Niki McMaster.

3. **What opportunities for training and professional development has the project provided?**
   Research associate Niki McMaster continued to improve her analytical skills in mycotoxin detection and quantification.

4. **How have the results been disseminated to communities of interest?**
   Schmale gave a series of lectures on mycotoxins for about 100 undergraduate students and 3 graduate students at Virginia Tech. McMaster communicated with USWBSI stakeholders via phone and email to coordinate sample collection, processing, and testing. Results were disseminated to stakeholders at the 2022 USWBSI meeting in Florida.

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?

x 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).

Machado, F. J., de Barros, A. V., McMaster, N., Schmale, D. G., Del Ponte, E. M., & Vaillancourt, L. J. 2023. A multivariate analysis of phenotypic traits of strains of Fusarium graminearum and F. meridionale supports structure by species. Plant Pathology, 13720.
https://doi.org/10.1111/ppa.13720
Status: Published
Acknowledgement of Federal Support: Yes

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.