

FY21 Performance Progress Report

Due date: July 26, 2022

Cover Page

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Fiscal Year:	2021
USDA-ARS Agreement ID:	59-0206-0-158
USDA-ARS Agreement Title:	Developing FHB Resistant Durum Wheat Varieties for Montana
FY20 USDA-ARS Award Amount:	\$38,760
Recipient Organization:	Montana State University Dept of Plant Sciences and Plant Pathology 119 Plant Biosciences, Bozeman, MT 59717-3150
DUNS Number:	625447982
EIN:	816010045
Recipient Identifying Number or Account Number, if any:	4W8488
Project/Grant Period:	5/15/21 - 5/14/23
Reporting Period End Date:	5/14/2022

USWBSI Individual Project(s)

USWBSI Research Category*	Project Title	ARS Award Amount
DUR-CP	Developing FHB Resistant Durum Wheat Varieties for Montana	\$38,760
FY21 Total ARS Award Amount		\$38,760

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

7/22/2022

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: Developing FHB Resistant Durum Wheat Varieties for Montana

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

Our goal is to develop durum varieties have FHB resistance and low DON accumulation. We have two objectives. 1. Screen durum wheat populations segregating for Fhb-1 and non-Fhb-1 sources of resistance using DNA markers in conjunction with screening for Fusarium head blight (FHB) resistance and DON accumulation in the field. 2. Work with USDA Scientist Xiwen Cai to move Fhb7 sources of resistance into Montana adapted durum varieties.

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?

1. We created 13 segregating populations by crossing resistant sources with a Montana adapted durum. The populations have been advanced twice in the greenhouse and field and populations were confirmed to be segregating for the appropriate FHB markers. The populations are being advanced toward field testing in 2023 when they will be planted in an irrigated field nursery at the Eastern Agricultural Research Center in Sidney, MT.

2. The movement of Fhb7 into durum wheat is currently being pursued by collaborator (and fellow SCAB project fundee, Dr. Xiwen Cai).

b) What were the significant results?

1. Screened populations for Fhb1 markers. Some of the populations were segregating for Fhb1 as expected and are being advanced toward field testing. Advanced populations in the greenhouse and starting backcrosses to move Fhb1 into adapted durum parents.

c) List key outcomes or other achievements.

1. Demonstrated that durum with Fhb1 is lower in FHB severity and lower in DON. Backcrossing of that gene into adapted durum varieties would be a significant advance in terms of lowering FHB and DON levels in Montana durum.

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

Two graduate students have been part of this project. They have become proficient in DNA preps, KASP markers, and are familiar with FHB screening.

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

Presented at two Montana State University field days to Montana State faculty and interested grower stakeholders.

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.