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:	59-0206-0-158
USDA-ARS Agreement Title:	Developing FHB Resistant Durum Wheat Varieties for Montana
Principle Investigator (PI):	Mike Giroux
Institution:	Montana State University
Institution UEI:	EJ3UF7TK8RT5
Fiscal Year:	2021
FY21 USDA-ARS Award Amount:	$38,760
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Period of Performance:	5/15/21 - 5/14/23
Reporting Period End Date:	5/14/2023

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 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

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Michael J. Giroux

_____ 5/21/2023_____

Principal Investigator Signature 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

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

A. Screen new sources of FHB resistance integrated from hexaploid wheat or wild relatives under Montana growing conditions.

B. Screen breeding progeny to allow early identification of FHB resistant or low DON accumulation genotypes.

C. Intercross genotypes with good FHB resistance and low DON levels to allow pyramiding of best FHB resistance alleles.

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?

A. We crossed with durum lines from NDSU in which FHB1 and FHB2 were integrated into durum wheat. We advanced the crosses to created segregating populations.

B. Our breeding lines and advanced genotypes were screened in an FHB screening nursery.

C. Did not make progress on this in FY21 since we were working toward that goal.

b) What were the significant results?

A. Identified durum lines with FHB1 and FHB2 to cross with from NDSU. Crossed with MSU durum genotypes. Advanced populations.

B. Identified level of FHB susceptibility in advanced and preliminary genotypes from our breeding populations

C. Identifying lines to be intercrossed in future years.

c) List key outcomes or other achievements.

A. Durum lines with FHB1 and FHB2 to cross with obtained from NDSU.
   a. First crosses made in 2021
   b. F1s advanced

B. Breeding populations were screened for FHB susceptibility and DON levels.

C. Working toward identifying lines with decent agronomics and seed quality for intercrossing.

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

Training one graduate student (PhD student Caleb Hale) and one undergraduate student.

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

Discussions with collaborators at the FHB national conference and at the Montana State Eastern Agricultural Research Center field day.

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).

None.

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).

None.

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.

Giroux. Durum breeding, new varieties, and single genes with big impacts. MSU Post Farm field day, July 8, 2021, 75 participants.

Giroux. Durum breeding, new varieties, and single genes with big impacts. MSU Eastern Swank off station field day. July 19, 2021, 35 participants.

Giroux. Durum breeding, new varieties, and single genes with big impacts. MSU Eastern Research Center field day. July 20, 2021, 75 participants.