

FY22 Performance Progress Report**Due date:** July 26, 2023**Cover Page**

USDA-ARS Agreement ID:	59-0206-2-120
USDA-ARS Agreement Title:	Breeding Fusarium Head Blight (FHB) Resistant Durum Varieties for Montana
Principle Investigator (PI):	Michael Giroux
Institution:	Montana State University
Institution UEI:	EJ3UF7TK8RT5
Fiscal Year:	2022
FY22 USDA-ARS Award Amount:	\$41,182
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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
DUR-CP	Developing FHB Resistant Durum Varieties for Montana	\$41,182
FY22 Total ARS Award Amount		\$41,182

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

5/21/2023

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: Developing FHB Resistant Durum Varieties for Montana

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.
- B. First crosses made in 2021, segregating crosses were advanced in the greenhouse and field.
- C. F1s advanced Segregating populations developed and sent to MSU Eastern for field screening.
- D. Breeding populations were screened for FHB susceptibility and DON levels. Populations were screened with FHB1 and FHB2. Those segregating for disease resistance genes had lower DON.
- E. Working toward identifying lines with decent agronomics and seed quality for intercrossing. Populations that have been screened for DON levels will be in the field in Bozeman in 2023.

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

Training one graduate student (PhD student Caleb Hale) and one undergraduate student. Caleb Hale presented a poster presentation at the FHB meeting in December 2022.

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 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).

None

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).

None

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.

Hale, C.O., F.K. Crutcher, X. Cai, J.D. Fiedler, A.C. Hogg, J.M. Martin, and M.J. Giroux. (2022). FHB Resistant Durum Wheat in Montana, Development and Testing. Proceedings of the 2022 National Fusarium Head Blight Forum; Tampa, FL. December 4-6, 2022. Retrieved from: <https://scabusa.org/forum/2022/2022NFHBForumProceedings.pdf>