USDA-ARS
U.S. Wheat and Barley Scab Initiative
FY20 Annual Performance Progress Report
Due date: July 29, 2021

Cover Page

Principle Investigator (PI):	Mike Giroux
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Fiscal Year:	2020
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 Office of Sponsored Programs Montana State University PO Box 172470 Bozeman, MT 59717-2470
DUNS Number:	625447982
EIN:	816010045
Recipient Identifying Number or Account Number:	4W8488
Project/Grant Reporting Period:	5/15/20 - 5/14/21
Reporting Period End Date:	5/14/2021

USWBSI Individual Project(s)

USWBSI Research Category*	Project Title	ARS Award Amount
DUR-CP	Developing FHB Resistant Durum Wheat Varieties for Montana	$ 38,760
	FY20 Total ARS Award Amount	**$ 38,760**

Michael J. Giroux

Principal Investigator

7/26/2021
Date

* MGMT – FHB Management
FST – Food Safety & Toxicology
R- Research
S – Service (DON Testing Labs)
GDER – Gene Discovery & Engineering Resistance
PBG – Pathogen Biology & Genetics
EC-HQ – Executive Committee-Headquarters
BAR-CP – Barley Coordinated Project
DUR-CP – Durum Coordinated Project
HWW-CP – Hard Winter Wheat Coordinated Project
VDHR – Variety Development & Uniform Nurseries – Sub categories are below:
SPR – Spring Wheat Region
NWW – Northern Soft Winter Wheat Region
SWW – Southern Soft Red Winter Wheat Region

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Project 1: *Developing FHB Resistant Durum Wheat Varieties for Montana*

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

1) Test new sources of Fusarium head blight (FHB) resistance developed in North Dakota for their efficacy in Montana.
2) Screen progeny lines to allow early identification of FHB resistant genotypes.
3) 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?

1) Lines were planted in a FHB screening nursery in Sidney, MT. The setup and management of the screening nursery was a major activity by itself since it required labor intensive care. We scored all lines for FHB infection and DON levels and identified parents to use in crosses. We also scored the durum intrastate nursery for FHB resistance and DON levels.
2) Progeny lines were planted in hill plots in Sidney, MT in the FHB screening nursery and lines were scored to identify those best suited for further crossing.
3) Populations with improved FHB resistance are being developed. In collaboration with Xiwen Cai we hope to have the *FHB7* gene moved into durum genotypes that are adapted to MT growing conditions.

b) What were the significant results?

Screening nursery was setup and lines were scored. Unfortunately, we had significant issues related to the weather and bird predation preventing us from obtaining high quality data on our plots. We did make additional crosses and advance populations containing FHB resistance genes forward in the greenhouse. We also feel that moving the *FHB7* into durum varieties will be a significant advance once it is complete.

c) List key outcomes or other achievements.

Advance populations containing 6x wheat derived FHB resistance into durum wheat. Moved populations forward and screened early generation material under field conditions. Work to integrate FHB7 via collaboration with Xiwen Cai.

3. **Was this research impacted by the COVID-19 pandemic (i.e. university shutdowns and/or restrictions, reduced or lack of support personnel, etc.)? If yes, please explain how this research was impacted or is continuing to be impacted.**

   No, it was not affected.

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

   Several undergraduate students worked on the project at both the Bozeman and Sidney, MT locations.

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

   The project is presented at field days to growers and was presented at the MSU-Sidney, MSU-Huntley, and MSU-Bozeman field days to fellow university scientists and staff, growers, and interested members of the public.

Training of Next Generation Scientists

Instructions: Please answer the following questions as it pertains to the FY20 award period (5/15/20 - 5/14/21). The term "support" below includes any level of benefit to the student, ranging from full stipend plus tuition to the situation where the student's stipend was paid from other funds, but who learned how to rate scab in a misted nursery paid for by the USWBSI, and anything in between.

1. **Did any graduate students in your research program supported by funding from your USWBSI grant earn their MS degree during the FY20 award period?**
   ☐Yes ☒No
   If yes, how many? Click to enter number here.

2. **Did any graduate students in your research program supported by funding from your USWBSI grant earn their Ph.D. degree during the FY20 award period?**
   ☐Yes ☒No
   If yes, how many? Click to enter number here.

3. **Have any post docs who worked for you during the FY20 award period and were supported by funding from your USWBSI grant taken faculty positions with universities?**
   ☐Yes ☒No
   If yes, how many? Click to enter number here.

4. **Have any post docs who worked for you during the FY20 award period and were supported by funding from your USWBSI grant gone on to take positions with private ag-related companies or federal agencies?**
   ☐Yes ☒No
   If yes, how many? Click to enter number here.

Release of Germplasm/Cultivars

Instructions: In the table below, list all germplasm and/or cultivars released with full or partial support through the USWBSI during the FY20 award period (5/15/20 - 5/14/21). All columns must be completed for each listed germplasm/cultivar. Use the key below the table for Grain Class abbreviations.

NOTE: Leave blank if you have nothing to report or if your grant did NOT include any VDHR-related projects.

Name of Germplasm/Cultivar	Grain Class	FHB Resistance	FHB Rating (0-9)	Year Released
Click here to enter text.	Select Grain Class	Select what represents your most resistant check	Enter as text 0-9 rating	Select Year
Click here to enter text.	Select Grain Class	Select what represents your most resistant check	Enter as text 0-9 rating	Select Year
Click here to enter text.	Select Grain Class	Select what represents your most resistant check	Enter as text 0-9 rating	Select Year
Click here to enter text.	Select Grain Class	Select what represents your most resistant check	Enter as text 0-9 rating	Select Year
Click here to enter text.	Select Grain Class	Select what represents your most resistant check	Enter as text 0-9 rating	Select Year
Click here to enter text.	Select Grain Class	Select what represents your most resistant check	Enter as text 0-9 rating	Select Year
Click here to enter text.	Select Grain Class	Select what represents your most resistant check	Enter as text 0-9 rating	Select Year
Click here to enter text.	Select Grain Class	Select what represents your most resistant check	Enter as text 0-9 rating	Select Year
Click here to enter text.	Select Grain Class	Select what represents your most resistant check	Enter as text 0-9 rating	Select Year
Click here to enter text.	Select Grain Class	Select what represents your most resistant check	Enter as text 0-9 rating	Select Year
Click here to enter text.	Select Grain Class	Select what represents your most resistant check	Enter as text 0-9 rating	Select Year
Click here to enter text.	Select Grain Class	Select what represents your most resistant check	Enter as text 0-9 rating	Select Year
Click here to enter text.	Select Grain Class	Select what represents your most resistant check	Enter as text 0-9 rating	Select Year
Click here to enter text.	Select Grain Class	Select what represents your most resistant check	Enter as text 0-9 rating	Select Year

NOTE: List the associated release notice or publication under the appropriate sub-section in the 'Publications' section of the FPR.

Publications, Conference Papers, and Presentations

Instructions: Refer to the PR_Instructions for detailed more instructions for listing publications/presentations about your work that resulted from all of the projects included in the FY20 grant award. Only citations for publications published (submitted or accepted) or presentations presented during the **award period (5/15/20 - 5/14/21**) should be included. If you did not publish/submit or present anything, state 'Nothing to Report' directly above the Journal publications section.

NOTE: Directly below each citation, you **must** indicate the Status (i.e. published, submitted, etc.) and whether acknowledgement of Federal support was indicated in the publication/ presentation. See example below for a poster presentation with an abstract:

Winn, Z.J., Acharya, R., Lyerly, J., Brown-Guedira, G., Cowger, C., Griffey, C., Fitzgerald, J., Mason R.E., and Murphy, J.P. (2020, Dec 7-11). Mapping of Fusarium Head Blight Resistance in NC13-20076 Soft Red Winter Wheat (p. 12). In: Canty, S., Hoffstetter, A. and Dill-Macky, R. (Eds.), *Proceedings of the 2020 National Fusarium Head Blight Forum*. https://scabusa.org/pdfs/NFHBF20_Proceedings.pdf.
Status: Abstract Published and Poster Presented
Acknowledgement of Federal Support: YES (Abstract and Poster)

Journal publications.

Hogg, A., P. Carr, J. Eberly, C. Chen, C. Kowatch, F. Crutcher, P. Lamb, K. McNamara, E. Haney, K. Kephart, V. Smith, L. Dykes, X. Chen, L. Huang, and M.J. Giroux. Registration of 'Lustre' Durum Wheat. Journal of Plant Registrations, submitted May 11, 2021.
Status: Submitted.
Acknowledgement of Federal Support: YES

Books or other non-periodical, one-time publications.

None

Other publications, conference papers and presentations.

Nothing to report.