USDA-ARS/
U.S. Wheat and Barley Scab Initiative
FY16 Final Performance Report
Due date: July 28, 2017

Cover Page

Principle Investigator (PI):	Jamie Sherman
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Fiscal Year:	2016
USDA-ARS Agreement ID:	59-0206-5-003
USDA-ARS Agreement Title:	Fusarium Head Blight Resistance for Montana Barley.
FY16 USDA-ARS Award Amount:	$ 14,563
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:	W5477
Project/Grant Reporting Period:	5/6/16 - 5/5/17
Reporting Period End Date:	05/05/17

USWBSI Individual Project(s)

USWBSI Research Category*	Project Title	ARS Award Amount
BAR-CP	Fusarium Head Blight Resistance for Montana Barley.	$ 14,563
	FY16 Total ARS Award Amount	**$ 14,563**

Jamie D Sherman 7/20/17
Principal Investigator Date

* MGMT – FHB Management
FST – Food Safety & Toxicology
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: *Fusarium Head Blight Resistance for Montana Barley.*

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

A. Utilize known sources of resistance to improve Montana varieties.
B. Screen current Montana germplasm for level of resistance.
C. Screen resistant lines for mycotoxin levels.
D. Identify new resistance to FHB.
E. Continue to make crosses of FHB resistance into Montana lines.

2. What was accomplished under these goals? *Address items 1-4) below for each goal or objective.*

A. Utilize known sources of resistance to improve Montana varieties.

1) major activities
Crosses with resistant lines(Kutahya, KtyQst55-5, W385Qst 82-6, W385Qst42-1, Quest, Pinnacle and Chevallier) were advance.
Crosses with resistant lines were tested for agronomics and selections made.
2) specific objectives
a). Lines advanced
b). Selections made based on agronomics
3) significant result - many of the selections have early heading
4) key outcomes or other achievements - none yet
Challenges: FHB screening was delayed for 1 year and is being initiated in 2017.

B. Screen current Montana germplasm for level of resistance.

1) major activities
In 2015, 91 lines were screened for FHB resistance in Langdon, ND. In 2016, 196 lines were screened in Idaho and 102 lines were screened in two locations (Fargo and Langdon) in North Dakota. Poor infestation was observed in ID. Poor correlations between severity was observed between all overlapping lines in all locations. Lines were also grown in Yellowstone valley with poor infestation.
2) specific objectives
Not met at this time
3) significant results
Lack of correlation between environments indicates more testing is needed to ID resistance in MT lines.
4) key outcomes or other achievements

C. Screen resistant lines for mycotoxin levels.

1) major activities
Schwarz screened lines in 2016 from ND trials. The ID trial was not sent for screening due to low infestation rates.
2) specific objectives Screening for DON was achieved
3) significant results - poor correlation between environments indicates more testing is required.
4) key outcomes or other achievements
None yet

D. Identify new resistance to FHB.

1) major activities
In 2016, we have developed the relevant 2 row NAM genetic maps this was delayed due to time to identify markers in GBS data.
2) specific objectives
We have not yet been able to screen the populations for resistance to FHB.
3) significant results
Lack of field repeatability is encouraging us to develop mist chamber for greenhouse screening at EARC.
4) key outcomes or other achievements
None yet

E. Continue to make crosses of FHB resistance into Montana lines.

1) major activities
10 crosses were made between resistant parents noted above and the most resistant lines from the 2015 screen. Lines are being inbred.
2) specific objectives
It is unclear whether the 2015 lines used were the best choices since 2016 data did not correlate well.
3) significant results
Need to use best lines from 2016 data was apparent due to lack of correlation between 2015 and 2016 data.
4) key outcomes or other achievements
None yet

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

Frankie Crutcher a new faculty member at EARC was provided with the opportunity to attend the SCAB conference in December of 2016, supporting the development of field and green house screening methods.

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

In seven field day talks we have described our efforts to growers and end users. At the MT Brewers Association meeting, we discussed concerns of FHB in brewing.

Training of Next Generation Scientists

Instructions: Please answer the following questions as it pertains to the FY16 award period. 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 FY16 award period?**
   No

   If yes, how many?

2. **Did any graduate students in your research program supported by funding from your USWBSI grant earn their Ph.D. degree during the FY16 award period?**
   No

   If yes, how many?

3. **Have any post docs who worked for you during the FY16 award period and were supported by funding from your USWBSI grant taken faculty positions with universities?**
   No

   If yes, how many?

4. **Have any post docs who worked for you during the FY16 award period and were supported by funding from your USWBSI grant gone on to take positions with private ag-related companies or federal agencies?**
   No

   If yes, how many?

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 FY16 award period. All columns must be completed for each listed germplasm/cultivar. Use the key below the table for Grain Class abbreviations. *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** (S, MS, MR, R, where R represents your most resistant check)	**FHB Rating** (0-9)	**Year Released**
None				

Add rows if needed.

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

Abbreviations for Grain Classes

Barley - BAR
Durum - DUR
Hard Red Winter - HRW
Hard White Winter - HWW
Hard Red Spring - HRS
Soft Red Winter - SRW
Soft White Winter - SWW

Publications, Conference Papers, and Presentations

Instructions: Refer to the FY16-FPR_Instructions for detailed instructions for listing publications/presentations about your work that resulted from all of the projects included in the FY16 grant. Only include citations for publications submitted or presentations given during your award period (5/6/16 - 5/5/17). If you did not have any publications or presentations, state 'Nothing to Report' directly above the Journal publications section.

Nothing to Report.

Journal publications.

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

Other publications, conference papers and presentations.