

**USDA-ARS/
U.S. Wheat and Barley Scab Initiative
FY15 Final Performance Report
Due date: July 15, 2016**

Cover Page

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Fiscal Year:	2015
USDA-ARS Agreement ID:	59-0206-5-002
USDA-ARS Agreement Title:	Montana Winter Wheat Fusarium Head Blight Resistance.
FY15 USDA-ARS Award Amount:	\$ 14,577
Recipient Organization:	Montana State University Office of Sponsored Programs PO Box 172470 Bozeman, MT 59717-2470
DUNS Number:	625447982
EIN:	816010045
Recipient Identifying Number or Account Number:	W5478
Project/Grant Reporting Period:	05/06/15-05/05/16
Reporting Period End Date:	05/05/16

USWBSI Individual Project(s)

USWBSI Research Category*	Project Title	ARS Award Amount
HWW-CP	Fusarium Head Blight Resistance for Montana Winter Wheat.	\$ 14,577
	FY15 Total ARS Award Amount	\$ 14,577

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

Project 1: *Fusarium Head Blight Resistance for Montana Winter Wheat.*

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

- a. Characterize publically released varieties and elite Montana breeding lines submitted into the Montana Interstate Winter Wheat trial for Fusarium Head Blight resistance.
- b. Make crosses between winter wheat lines with known Fusarium Head Blight resistance and Montana adapted winter wheat germplasm.

2. What was accomplished under these goals?

1) Major Activities:

Major activities funded by this grant were to screen advanced Montana adapted winter wheat breeding lines for Fusarium Head Blight Resistance (FHB). Additionally, winter wheat lines known to be resistant to fusarium head blight were crossed to Montana adapted winter wheat varieties.

2) Specific Objectives:

Montana Intrastate Winter Wheat trial was screened for FHB resistance during the 2015 growing season in a non-replicated single row nursery planted near Bozeman, MT. The FHB nursery was inoculated with FHB and mist-irrigated. Additionally, one entry space was provided by North Dakota State University for submission of a Montana adapted winter wheat line in the FHB uniform screening nursery. We submitted the elite Montana breeding line MT1078, which was found to have Fhb1 based on molecular marker data. Lastly, FHB resistance winter wheat lines were crossed to elite Montana adapted winter wheat varieties.

3) Significant Results:

No onset of FHB was observed in the Bozeman, MT screening nursery. It was concluded the Bozeman environment was not suitable for the infection of FHB in winter wheat, thus initiating a search for a more appropriate location that will generate useful winter wheat FHB resistance data. The percentage of MT1078 infected spikelets at the Nebraska nursery was 9%, and the percentage of infected spikelets measured in the Kansas nursery was 15.3%, thus indicating some level of FHB resistance in MT1078 compared to the moderately resistant check varieties Overland and Everest.

In 2015, 42 crosses were made using Emerson and MT1078 as the FHB resistance donor parents. Populations derived from the crosses will be advanced through the winter wheat breeding pipeline from which lines will be selected for FHB resistance evaluation.

4) Key Outcomes or Other Achievements:

Key outcomes from this research project include acquiring information on the suitability of Bozeman, MT for screening FHB resistance in winter wheat breeding lines, obtaining evidence that MT1078 has some resistance to FHB, and crossing FHB tolerant lines to Montana adapted breeding material for eventual selection of FHB resistant winter wheat varieties. Moving forward, our top priorities will be to identify a suitable location for screening FHB resistance in advanced Montana winter wheat lines, and advance FHB resistant germplasm through the winter wheat breeding pipeline. In 2016, the Montana Interstate Winter Wheat nursery will be evaluated in Minot, ND, where severe FHB infection has occurred in winter wheat in recent years with the expectation this location will provide

usable FHB resistance data. Lastly, the number of Montana entries in the FHB uniform screening nursery was expanded to 15 for the 2016 growing season allowing further evaluation of MT1078 and 14 additional Montana adapted lines.

3. What opportunities for training and professional development has the project provided? None

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

We have not disseminated results from our research efforts, because we want more than one year of Fusarium Head Blight resistance data before we present any conclusive results on the level of Fusarium Head Blight resistance present in publically available Montana adapted winter wheat varieties. It has been communicated to Montana wheat producers and stakeholders that we are now part of USWBSI, which has garnered a positive response.

Training of Next Generation Scientists

Instructions: Please answer the following questions as it pertains to the FY15 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 FY15 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 FY15 award period? No**

If yes, how many?

- 3. Have any post docs who worked for you during the FY15 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 FY15 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 FY15 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

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

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Publications, Conference Papers, and Presentations

Refer to the FY15-FPR_Instructions for listing publications/presentations about your work that resulted from all of the projects included in the FY15 grant. 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.