

**USDA-ARS/  
U.S. Wheat and Barley Scab Initiative  
FY19 Final Performance Progress Report  
Due date: August 31, 2021**

**Cover Page**

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<b>Fiscal Year:</b>	2019
<b>USDA-ARS Agreement ID:</b>	59-0206-7-001
<b>USDA-ARS Agreement Title:</b>	FHB Management in Barley: QTL Deployment and Phenotyping
<b>FY19 USDA-ARS Award Amount:</b>	\$ 13,175
<b>Recipient Organization:</b>	North Dakota State University Office of Grant & Contract Accounting NDSU Dept 3130, PO Box 6050 Fargo, ND 58108-0650
<b>DUNS Number:</b>	80-388-2299
<b>EIN:</b>	45-6002439
<b>Recipient Identifying Number or Account Number:</b>	FAR0028113
<b>Project/Grant Reporting Period:</b>	7/12/19 - 7/11/21
<b>Reporting Period End Date:</b>	7/11/2021

**USWBSI Individual Project(s)**

<b>USWBSI Research Category*</b>	<b>Project Title</b>	<b>ARS Award Amount</b>
BAR-CP	Coordination of NABSEN and Collaborative Screening of Western US Barley Germplasm	\$ 13,175
<b>FY19 Total ARS Award Amount</b>		<b>\$ 13,175</b>



Principal Investigator

8/31/2021

Date

\* MGMT – FHB Management  
 FST – Food Safety & Toxicology  
   R – Research  
   S – Service (DON Testing Lab)  
 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:** *Coordination of NABSEN and Collaborative Screening of Western US Barley Germplasm*

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

The project goals are to promote collaboration between North American barley breeding programs to advance and distribute elite barley germplasm with resistance to Fusarium head blight. Major goals include coordinating the exchange and distribution of advanced FHB resistant barley germplasm between NABSEN collaborators to expedite the development of resistant barley varieties.

**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?**

Our project coordinated, received, and distributed advanced breeding lines from the University of Minnesota, Busch Ag, USDA-ARS Canadian breeding Group and NDSU breeding programs for FHB nurseries and managed the Fargo, and Langdon, ND misted/inoculated FHB nurseries. Advanced lines were assessed for resistance across seven locations. The locations in 2019 were: Fargo, Osnabrock, Casselton and Langdon, ND; Crookston and St. Paul, MN; and Brandon, Manitoba Canada. Nurseries compared FHB severity and incidence, heading date and DON accumulation on misted and dryland plots.

**b) What were the significant results?**

We planted, evaluated, and harvested a total of 41 advanced breeding lines planted in short rows and with 3 replications in 2019 in Fargo and Langdon misted nurseries. The misted nurseries were inoculated with infected FHB corn spawn to ensure good infection. Heading date, FHB incidence, and severity notes were collected along with DON accumulation. In 2019, two Canadian advanced lines had DON means lower than the standard two-rowed check Conlon and two lines from the North Dakota Breeding Program had DON means just above the Conlon standard resistant check.

**c) List key outcomes or other achievements.**

Data collected from the NABSEN trials informed which advanced lines had the highest levels of FHB resistance. Those advanced lines with the highest levels of FHB resistance will be crossed to other breeding lines to incorporate the FHB resistances. These lines could also become varieties and be release to growers.

**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.**

COVID only effected DON analysis later in the year.

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

At NDSU, two undergraduate student workers were trained in preparation for planting, scoring, maintaining hill plots, and harvesting.

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

The NABSEN report for 2019 has been submitted to all NABSEN collaborators and to USWBSI. This information can be accessed online. The data is also uploaded to the T3 database.

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## Training of Next Generation Scientists

**Instructions:** Please answer the following questions as it pertains to the **FY19 award period (7/12/19 - 7/11/21)**. 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 FY19 award period?**

Yes     No     Not Applicable

**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 FY19 award period?**

Yes     No     Not Applicable

**If yes, how many?** [Click to enter number here.](#)

**3. Have any post docs who worked for you during the FY19 award period and were supported by funding from your USWBSI grant taken faculty positions with universities?**

Yes     No     Not Applicable

**If yes, how many?** [Click to enter number here.](#)

**4. Have any post docs who worked for you during the FY19 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     Not Applicable

**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 **FY19 award period (7/12/19 - 7/11/21)**. 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
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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.

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## **Publications, Conference Papers, and Presentations**

**Instructions:** Refer to the FPR\_Instructions for detailed more instructions for listing publications/presentations about your work that resulted from all of the projects included in the FY19 grant award. Only citations for publications published (submitted or accepted) or presentations presented during the **award period (7/12/19 - 7/11/21)** 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:

Z.J. Winn, R. Acharya, J. Lyerly, G. Brown-Guedira, C. Cowger, C. Griffey, J. Fitzgerald, R.E. Mason and J.P. Murphy. 2020. "Mapping of Fusarium Head Blight Resistance in NC13-20076 Soft Red Winter Wheat." In: S. Canty, A. Hoffstetter, and R. Dill-Macky (Eds.), *Proceedings of the 2020 National Fusarium Head Blight Forum* (p. 12.), Virtual; December 7-11. Online: [https://scabusa.org/pdfs/NFHBF20\\_Proceedings.pdf](https://scabusa.org/pdfs/NFHBF20_Proceedings.pdf).  
Status: Abstract Published and Poster Presented  
Acknowledgement of Federal Support: YES (Abstract and Poster)

### **Journal publications.**

None

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

None

### **Other publications, conference papers and presentations.**

NABSEN Report 2019 completed in December 2019 and sent to all Cooperators attending the USWBSI conference.

Status: Published

Acknowledgement of Federal Support: NO