

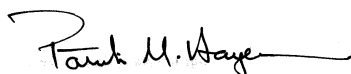
**USDA-ARS**  
**U.S. Wheat and Barley Scab Initiative**  
**FY18 Performance Report**  
**Due date: September 23, 2019**

**Cover Page**

<b>Principle Investigator (PI):</b>	Patrick Hayes
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<b>Fiscal Year:</b>	2018
<b>USDA-ARS Agreement ID:</b>	59-0206-7-156
<b>USDA-ARS Agreement Title:</b>	Production of Double Haploid for FHB Resistance.
<b>FY18 USDA-ARS Award Amount:</b>	\$ 68,976
<b>Recipient Organization:</b>	Office for Sponsored Research and Award Administration Oregon State University A312 Kerr Administration Building Corvallis, OR 97331-2140
<b>DUNS Number:</b>	053599908
<b>EIN:</b>	61-1730890
<b>Recipient Identifying Number or Account Number:</b>	RO719A
<b>Project/Grant Reporting Period:</b>	8/1/18 - 7/31/19
<b>Reporting Period End Date:</b>	07/31/19

**USWBSI Individual Project(s)**

<b>USWBSI Research Category*</b>	<b>Project Title</b>	<b>ARS Award Amount</b>
BAR-CP	Collaborative Doubled Haploid Production for FHB Resistance Breeding.	\$ 68,976
	<b>FY18 Total ARS Award Amount</b>	\$ 68,976



September 13, 2019

Principal Investigator

Date

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\* 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:** *Collaborative Doubled Haploid Production for FHB Resistance Breeding.*

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

Our overall project goal is to increase the efficiency with which researchers identify and deploy genes and QTLs that contribute to reduction in the losses caused by Fusarium head blight (FHB). This can be achieved by developing doubled haploid germplasm from the F1s of cross combinations identified by collaborating breeders. Doubled haploids - being complete homozygotes – are immortal reference stocks that provide unequivocal genotyping and phenotyping data.

Our project objectives for each of the two years are to:

1. Produce ~ 1,666 plantlets from the F1 donor plants.
2. Ship the *in vitro* plantlets to cooperators, who will raise them to seed – generating a total of ~1,000 doubled haploid plants.

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

### 1) *major activities*

The F1s received from USWBSI cooperators that were used as donor plants traced to the following pedigrees:

- 95SR316A/ND Genesis; USDA-ARS, Idaho
- 95SR316A/Gadsby; USDA-ARS, Idaho
- VA15H-73(2R)/Violetta; Virginia Tech
- VA15H-73(2R)/Flavia; Virginia Tech

DH from the following crosses were generated by the OSU Project with other primary objectives, but they may be of interest to USWBSI cooperators based on the observation that DH130910 and RCSL124 may have some tolerance/resistance to FHB.

- DH130910/Survivor
- RCSL124/07MWA-201

The following are totals for USWBSI collaborators and OSU.

885 donor tillers were harvested; 26,550 anthers were plated; 2,936 green plantlets were regenerated

The following are totals for USWBSI collaborators only:

- 2,199 green plantlets shipped
- 1,723 doubled haploids harvested (383 for USDA-ARS ID and 1,340 for Virginia Tech)

From the OSU crosses, 743 green plantlets were produced and 411 were DH harvested.

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2) *specific objectives*

- Produce and ship 1,666 Green Plantlets (GPs) – generating 1,000 DH lines for USWBSI collaborators
- Provide additional germplasm resources for the USWBSI

3) *significant results*

Goals exceeded:

- 2,936 GPs were shipped, generating 1,723 DHs
- An additional 411 DH available from OSU for interested collaborators

4) *key outcomes or other achievements*

Mission accomplished

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

Tanya Filichkin and Laura Helgerson honed their doubled haploid and plant propagation skills, respectively. They communicated effectively with collaborators and are nationally recognized for their efforts.

Brigid Meints attended the 2018 USWBSI Forum as a representative of the OSU Barley Project. She presented a poster and networked with participants.

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

At the USWBSI Scab Forum and in UWBSI progress reports.

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### **Training of Next Generation Scientists**

**Instructions:** Please answer the following questions as it pertains to the FY18 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 FY18 award period?**

NA

2. **Did any graduate students in your research program supported by funding from your USWBSI grant earn their Ph.D. degree during the FY18 award period?**

NA

3. **Have any post docs who worked for you during the FY18 award period and were supported by funding from your USWBSI grant taken faculty positions with universities?**

NA

4. **Have any post docs who worked for you during the FY18 award period and were supported by funding from your USWBSI grant gone on to take positions with private ag-related companies or federal agencies?**

NA

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**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 FY18 award period. 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.*

**Collaborators who received doubled haploids and are therefore empowered to provide this information for their germplasm. For the doubled haploids developed by the OSU program, research is still in progress.**

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**

**Instructions:** Refer to the FY18-FPR\_Instructions for detailed instructions for listing publications/presentations about your work that resulted from all of the projects included in the FY18 grant. Only include citations for publications submitted or presentations given during your award period (8/1/18 - 7/31/19). If you did not have any publications or presentations, state 'Nothing to Report' directly above the Journal publications section.

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

Conley, E.J., and J.A. Anderson. 2018. Accuracy of Genome-Wide Prediction for Fusarium Head Blight Associated Traits in a Spring Wheat Breeding Program. In: Proceedings of the XXIV International Plant & Animal Genome Conference, San Diego, CA.

Status: Abstract Published and Poster Presented

Acknowledgement of Federal Support: YES (poster), NO (abstract)

#### **Journal publications.**

NA

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

NA

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

Meints, B., T. Filichkin, L. Helgersen, J. Hernandez, S. Fisk, B. Robinson, and P. Hayes. 2018. Collaborative Doubled Haploid Breeding for Fusarium Head Blight Resistance in Barley In: Proceedings of the 2018 National Fusarium Head Blight Forum, St. Louis, MO.

Status: Abstract Published and Poster Presented

Acknowledgement of Federal Support: **YES** (poster and abstract)