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

### Cover Page

<table>
<thead>
<tr>
<th>Principle Investigator (PI):</th>
<th>Jose Gonzalez</th>
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<tbody>
<tr>
<td>Institution:</td>
<td>South Dakota State University</td>
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<td>E-mail:</td>
<td><a href="mailto:jose.gonzalez@sdstate.edu">jose.gonzalez@sdstate.edu</a></td>
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<td>Phone:</td>
<td>605-688-6907</td>
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<td>Fiscal Year:</td>
<td>2016</td>
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<tr>
<td>USDA-ARS Agreement ID:</td>
<td>59-0200-3-005</td>
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<tr>
<td>USDA-ARS Agreement Title:</td>
<td>Molecular Characterization and Pyramiding of Novel Scab Resistance Sources Adapted to the Northern Plains Growing Region.</td>
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<tr>
<td>FY16 USDA-ARS Award Amount:</td>
<td>No Cost Extension (NCE)</td>
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</table>
| Recipient Organization:      | South Dakota State University  
|                              | SAD 133, Box 2201  
|                              | Brookings, SD 57007 |
| DUNS Number:                 | 929929743 |
| EIN:                         | 46-6000364 |
| Recipient Identifying Number or Account Number: | 3F4428 |
| Project/Grant Reporting Period: | 5/1/16 - 4/30/17 |
| Reporting Period End Date:   | 04/30/17 |

### USWBSI Individual Project(s)

<table>
<thead>
<tr>
<th>USWBSI Research Category*</th>
<th>Project Title</th>
<th>ARS Award Amount</th>
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</thead>
<tbody>
<tr>
<td>HWW-CP</td>
<td>Pyramiding Multiple FHB Resistance QTLs in Different Winter Wheat Backgrounds.</td>
<td>NCE</td>
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</table>

**FY16 Total ARS Award Amount**  
NCE

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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
FY16 Final Performance Report  
PI: Gonzalez, Jose  
USDA-ARS Agreement #: 59-0200-3-005  
Reporting Period: 5/1/16 - 4/30/17

**Project 1: Pyramiding Multiple FHB Resistance QTLs in Different Winter Wheat Backgrounds.**

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

   Currently this project is testing, in field and greenhouse trials, double haploid populations (>200 individuals) from few selected families derived using 3- and 4-way crosses between different sources of resistance to FHB (Ernie, Freedom, Lyman, Overland and NE06546 in addition to existing elite lines with *Fhb1* such as Wesley-*Fhb1* and AL-107-6106). We have also included *AC Emerson*, a recent release from Canterra Seeds (Ag Canada initiative) has shown very good levels of FHB resistance; in our field trial *AC Emerson* has similar or better levels of resistance than our resistant controls. *AC Emerson* is not a carrier of the *Fhb1* locus.

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

   1) major activities
      - Evaluation of DH lines
      - Population development including *AC Emerson*
   2) specific objectives
      - Field evaluation of DH lines derived from Overland/WesleyFHB-BC56//Ernie/NE06545 and AL-107-6106/Overland//Lyman/WesleyFHB-BC06
      - Population development to bring together resistance loci in *AC Emerson* with *Fhb1* and other loci
   3) significant results.
      - Of the ~200 DH lines evaluated in the previous year 64 lines were selected for advanced evaluation in the 2016-2017 season in two-rows plots. Additionally, the ten lines with superior scab resistance and general agronomic performance were directly advanced to EYT’s in 2 locations.
      - *AC Emerson* populations were developed and have been planted in the 2016-2017 growing season for evaluation.
   4) key outcomes or other achievements
      - Selected DHs lines are being prepared for public released. A release manuscript is being completed.

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

   One PhD student has been trained and is finishing his dissertation in September.

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

   Thru presentations in the Annual Scab Forum.

(Form – FPR16)
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?

(Form – FPR16)
**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.*

<table>
<thead>
<tr>
<th>Name of Germplasm/Cultivar</th>
<th>Grain Class</th>
<th>FHB Resistance (S, MS, MR, R, where R represents your most resistant check)</th>
<th>FHB Rating (0-9)</th>
<th>Year Released</th>
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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

(Form – FPR16)
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 (5/1/16 - 4/30/17). 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 presented at the FHB Forum:

Status: Abstract Published and Poster Presented
Acknowledgement of Federal Support: YES (poster), NO (abstract)

Journal publications.

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

Other publications, conference papers and presentations.

Status: Invited talk given
Acknowledgement of Federal Support: yes

Status: Poster presented
Acknowledgement of Federal Support: yes

Status: Poster presented
Acknowledgement of Federal Support: yes

(Form – FPR16)