

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

Cover Page

Principle Investigator (PI):	Harold Trick
Institution:	Kansas State University
E-mail:	hnt@ksu.edu
Phone:	785-532-1426
Fiscal Year:	2016
USDA-ARS Agreement ID:	59-0206-6-007
USDA-ARS Agreement Title:	A Centralized Wheat Transformation Facility for the <i>Fusarium</i> Community.
FY16 USDA-ARS Award Amount:	\$ 57,784
Recipient Organization:	Kansas State University 10 Anderson Hall Manhattan, KS 66506
DUNS Number:	929773554
EIN:	48-0771751
Recipient Identifying Number or Account Number:	AR9854 / GAPP603893
Project/Grant Reporting Period:	5/23/16 - 5/22/17
Reporting Period End Date:	05/22/17

USWBSI Individual Project(s)

USWBSI Research Category*	Project Title	ARS Award Amount
GDER	A Centralized Wheat Transformation Facility for the <i>Fusarium</i> Community.	\$ 57,784
	FY16 Total ARS Award Amount	\$ 57,784



7/27/2017

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: *A Centralized Wheat Transformation Facility for the Fusarium Community.*

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

The major goal of this project was to create a wheat plant transformation facility for U.S. Wheat and Barley Scab Initiative. The main objective was to generate transgenic plants and provide T1 generation seed stocks to funded Initiative research projects.

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

1) major activities

The transformation facility has setup protocols to provide transformation services year round. Cultivars are planted weekly or biweekly to ensure constant supply of immature embryos used as targets for genetic transformations. On a weekly basis several experiments are simultaneously going. After transformation the cultures go through the transformation selection, plant regeneration process, followed by molecular confirmation genetic transformation. Approximately five-six months after initiating transformation seeds representing the T1 generation were and will be harvested and mailed to PIs under the appropriate APHIS Permit.

2) specific objectives

PI's from two Initiative funded projects [FY16-RA-026 (Rawat) and FY16-TU-011 (Tumer)] and one previously fund project FY13-XU-034 (Xu) have submitted vectors for wheat transformation.

3) significant results

For project FY16-TU-0111 two vectors have been submitted and to date a total of 43 (23 + 21) separate bombardments were performed. Four cultivars have been used in these experiments including Bobwhite, Forefront, RB07 and CB037. Selection and regeneration is still ongoing for a few of these experiments but a total of 47 (24+23) transgenic lines have been identified and 26 events have been shipped to the PI.

For project FY16-RA-026 (Rawat) five vectors have been submitted and to date a total of 42 (4+15+8+7+8) separate bombardments were performed generating 44 transgenic lines. Cultivars used for this project were Bobwhite and Fielder as requested by the PI.

For project FY13-XU-034 (Xu) fourteen vectors have been submitted. Transformation for these vectors is on hold until further information is received about the constructs from the PI.

4) key outcomes or other achievements

The generation of wheat transgenic lines for collaborators and providing them with seeds representing T1 generation.

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

This project, in part, has provided tissue culture and transformation of wheat cultures training for one Post doc (Yueying Chen), one PhD student (Jordan Brungardt) and one undergraduate (Rachel Peterson).

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

Individuals providing vectors were updated periodically of progress on their requests.

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?

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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 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

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 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 (5/23/16 - 5/22/17). If you did not have any publications or presentations, state ‘Nothing to Report’ directly above the Journal publications section.

Journal publications.

Nothing to report

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

Nothing to report

Other publications, conference papers and presentations.

*McLaughlin, J.E., Finn, D., Tyagi, N., Trick, H. McCormick, S. and Tumer, N.E. 2016.
“Expression of an *Arabidopsis* nonspecific lipid transfer protein in *Pichia Pastoris* and wheat.” In: S. Canty, A. Clark, K. Wolfe and D. Van Sanford (Eds.), *Proceedings of the 2016 National Fusarium Head Blight Forum* (p. 110). East Lansing, MI/Lexington, KY: U.S. Wheat & Barley Scab Initiative. Poster 53.

Status: Abstract Published and Poster Presented

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

*presentation used transgenic wheat from this grant