USDA-ARS
U.S. Wheat and Barley Scab Initiative
FY17 Final Performance Report
Due date: July 31, 2018

Cover Page

Principle Investigator (PI):	Harold Trick
Institution:	Kansas State University
E-mail:	hnt@ksu.edu
Phone:	785-532-1426
Fiscal Year:	2017
USDA-ARS Agreement ID:	59-0206-6-007
USDA-ARS Agreement Title:	A Centralized Wheat Transformation Facility for the Fusarium Community.
FY17 USDA-ARS Award Amount:	$ 57,672
Recipient Organization:	Kansas State University 10 Andrerson Hall Manhattan, KS 66506
DUNS Number:	929773554
EIN:	48-0771751
Recipient Identifying Number or Account Number:	AR9854 / GAPP603893
Project/Grant Reporting Period:	5/23/17 - 5/22/18
Reporting Period End Date:	05/22/18

USWBSI Individual Project(s)

USWBSI Research Category*	Project Title	ARS Award Amount
GDER	A Centralized Wheat Transformation Facility for the Fusarium Community.	$ 57,672
	FY17 Total ARS Award Amount	$ 57,672

7/29/2018
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 three Initiative funded projects [FY16-RA-026 (Rawat), FY16-SH004 (Shah) and FY16-TU-011 (Tumer)] have submitted vectors for wheat transformation.

3) significant results

For project FY16-TU-0111 four vectors including a blank cassette were submitted and a total of 50 separate bombardments were performed. Three cultivars have been used in these experiments including Bobwhite, Forefront, and RB07. Selection and regeneration is still ongoing for a few of these experiments but a total of 35 transgenic lines have been identified and 20 events have been shipped to the PI.

For project FY16-RA-026 (Rawat) five vectors were submitted and eight separate bombardments were performed generating 13 transgenic lines. Cultivars used for this project were Bobwhite and Fielder as requested by the PI.

For project FY16-SH004 (Shah) two vectors have been submitted. thirty separate bombardments have been made for these two vectors and ten putative transformed lines have been identified. Selection still continues for these vectors.

4) key outcomes or other achievements

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

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 undergraduates (Rachel Peterson and Harley-Payj Leatherman).

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 FY17 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 FY17 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 FY17 award period?** No

   If yes, how many?

3. **Have any post docs who worked for you during the FY17 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 FY17 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

   If yes, how many? One

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 FY17 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

Publications, Conference Papers, and Presentations

Instructions: Refer to the FY17-FPR_Instructions for detailed instructions for listing publications/presentations about your work that resulted from all of the projects included in the FY17 grant. Only include citations for publications submitted or presentations given during your award period (5/23/17 - 5/22/18). 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:

Journal publications.

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

Other publications, conference papers and presentations.

Zhenqi Su, Amy N. Bernardo, Bin Tian, Shan Wang, Hongnxiang Ma, Shibin Cai, Dongtao Liu, Dadong Zhang, Tao Li, Harold N. Trick, Paul St Amand, Jianming Yu, Zengyan Zhang and Guihua Bai, A Sequence Deletion in HRC-like Gene Confers Fhb1 Resistance to Fusarium Head Blight in Wheat, PAG XXV Jan 14-18, 2017, P0894.
Status: Abstract Published and Poster Presented
Acknowledgement of Federal Support: YES (poster), NO (abstract)

John E. McLaughlin, Neerja Tyagi, Harold Trick, Susan McCormick and Nilgun E. Tumer. Resistance to Fusarium graminearum and Fusarium Mycotoxins by Expression of Arabidopsis and Wheat Non-specific Lipid Transfer Proteins in Wheat. Proceedings of the 2017 National Fusarium Head Blight Forum. S. Canty, A. Clark, E. Walton, D. Ellis, J. Mundell, and D. Van Sanford, eds. ASAP Printing, Inc., Okemos, MI. Page 49.
Status: Abstract Published and Poster Presented
Acknowledgement of Federal Support: YES (poster), NO (abstract)

Zhenqi Su, Amy Bernardo, Bin Tian, Shan Wang, Hongxiang Ma, Shibin Cai, Dongtao Liu, Dadong Zhang, Tao Li, Harold Trick, Paul St. Amand, Jianming Yu, Zengyan Zhang and Guihua Bai. Loss Function of *TAHR*C in the *FHB1* region increased wheat FHB Resistance. Proceedings of the 2017 National Fusarium Head Blight Forum. S. Canty, A. Clark, E. Walton, D. Ellis, J. Mundell, and D. Van Sanford, eds. ASAP Printing, Inc., Okemos, MI. Page 53.
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