

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

Cover Page

Principle Investigator (PI):	James Thomson
Institution:	USDA-ARS
E-mail:	James.Thomson@ars.usda.gov
Phone:	510-559-5721
Fiscal Year:	2016
USDA-ARS Agreement ID:	N/A
USDA-ARS Agreement Title:	Down with DON: Stable Expression of Proven Genes in a Marker-free Background.
FY16 USDA-ARS Award Amount:	\$ 5,000

USWBSI Individual Project(s)

USWBSI Research Category*	Project Title	ARS Award Amount
GDER	Down with DON: Stable Expression of RNAi Constructs in a Marker-free Plant.	\$ 5,000
FY16 Total ARS Award Amount		\$ 5,000


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: *Down with DON: Stable Expression of RNAi Constructs in a Marker-free Plant.*

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

- 1) Construct *Ds*, RMCE, and EXCH barley backbone vectors.
- 2) Construct fungal RNAi vectors targeting *TRI5*, *TRI6*, and *LAEA*, and test them in *Fg*.
- 3) Introduce dsRNA sequences effective against *Fg* into barley *Ds* and EXCH vectors.
- 4) Produce transgenic Conlon plants with *Ds*-bordered *Ds*-vectors or TAG sites.
- 5) Initiate transposition of *Ds*-bordered sequences by crossing to *AcT* plants.
- 6) Select plants with *Ds*-vectors or TAG sites segregated from *AcT* and the original insertion site.
- 7) For RMCE only: Introduce EXCH vectors carrying antifungal transgenes that will be incorporated into TAG sites via site-specific recombination.
- 8) Characterize transgene expression, FHB/DON, plant performance, and develop resistant lines.

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

- 1) major activities: Construct *Ds*, RMCE, and EXCH barley backbone vectors.
- 2) specific objectives: EXCH-B and P vectors and recombinase expression platform backbone constructs completed have been completed.
- 3) significant results: EXCH-B and P vectors allow introduction of any gene(s) of interest for genome targeting. Currently, RNAi vector *TRI6* is being constructed.
- 4) key outcomes or other achievements: RMCE genome targeting system is ready for use.

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

NONE

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

RMCE technology has been published and is available for use in other plant systems

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?

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

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. If you did not have any publications or presentations, state ‘Nothing to Report’ directly above the Journal publications section.

Nothing to Report.

Journal publications.

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

Other publications, conference papers and presentations.