

## FY21 Performance Progress Report

**Due date:** July 26, 2022

### Cover Page

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<b>Fiscal Year:</b>	2021
<b>USDA-ARS Agreement ID:</b>	59-0206-0-151
<b>USDA-ARS Agreement Title:</b>	A Centralized Wheat Transformation Facility for the Fusarium Community
<b>FY20 USDA-ARS Award Amount:</b>	\$77,209
<b>Recipient Organization:</b>	Kansas State University Dept of Plant Pathology 1712 Claflin Rd, 4024 Throckmorton Manhattan, KS 66506
<b>DUNS Number:</b>	929773554
<b>EIN:</b>	48-0771751
<b>Recipient Identifying Number or Account Number, if any:</b>	AR9768 / GAPP006347
<b>Project/Grant Period:</b>	5/23/21 - 5/22/23
<b>Reporting Period End Date:</b>	5/22/2022

### USWBSI Individual Project(s)

USWBSI Research Category*	Project Title	ARS Award Amount
GDER	A Centralized Wheat Transformation Facility for the Fusarium Community	\$77,209
<b>FY21 Total ARS Award Amount</b>		<b>\$77,209</b>

I am submitting this report as an:       Annual Report       Final Report

*I certify to the best of my knowledge and belief that this report is correct and complete for performance of activities for the purposes set forth in the award documents.*



\_\_\_\_\_  
Principal Investigator Signature

7/21/2022

\_\_\_\_\_  
Date Report Submitted

† BAR-CP – Barley Coordinated Project  
 DUR-CP – Durum Coordinated Project  
 EC-HQ – Executive Committee-Headquarters  
 FST-R – Food Safety & Toxicology (Research)  
 FST-S – Food Safety & Toxicology (Service)  
 GDER – Gene Discovery & Engineering Resistance  
 HWW-CP – Hard Winter Wheat Coordinated Project

MGMT – FHB Management  
 MGMT-IM – FHB Management – Integrated Management Coordinated Project  
 PBG – Pathogen Biology & Genetics  
 TSCI – Transformational Science  
 VDHR – Variety Development & Uniform Nurseries  
 NWW – Northern Soft Winter Wheat Region  
 SPR – Spring Wheat Region  
 SWW – Southern Soft Red Winter Wheat Region

## **Project 1:** A Centralized Wheat Transformation Facility for the Fusarium Community

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

The major goal of this project was to maintain a wheat plant transformation facility for U.S. Wheat and Barley Scab Initiative. The main objective was to generate transgenic and/or gene –edited plants and provide T<sub>1</sub> generation seed stocks to funded Initiative research projects.

### **2. What was accomplished under these goals or objectives? (For each major goal/objective, address these three items below.)**

#### **a) What were the 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 T<sub>1</sub> generation were and will be harvested and mailed to PIs under the appropriate APHIS movement Permit.

#### **b) What were the significant results?**

Transgenic events were supplied for seven plasmid constructions to Guihua Bai's program, one construction to Jyoti Shah's program, and two constructions to Kistler's program. Wheat cultivars used were Bobwhite, RB07, Forefront, and Rollag. During the funding period 287 liberty positive plants were produced for Bai, 14 for Shah and 24 for Kistler. T<sub>1</sub> transgenic seeds were shipped to Bai, Shah and we are currently waiting for APHIS approval for shipping Kistler's seeds. Additional events for each of these constructions are pending and are various stages of the transformation pipeline.

#### **c) List key outcomes or other achievements.**

The generation of wheat transgenic lines for collaborators and providing them with seeds representing T<sub>1</sub> 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 M.S. student (Sophie Filbert)

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

Individuals providing vectors were updated periodically of progress on their requests and at the annual NFHBF and GDER mid-year meetings.

## Publications, Conference Papers, and Presentations

Please include a listing of all your publications/presentations about your **FHB work** that were a result of funding from your FY21 grant award. Only citations for publications published (submitted or accepted) or presentations presented during the **award period** should be included.

**Did you publish/submit or present anything during this award period?**

- Yes, I've included the citation reference in listing(s) below.  
 No, I have nothing to report.

### Journal publications as a result of FY21 grant award

List peer-reviewed articles or papers appearing in scientific, technical, or professional journals. Include any peer-reviewed publication in the periodically published proceedings of a scientific society, a conference, or the like.

Identify for each publication: Author(s); title; journal; volume: year; page numbers; status of publication (published [include DOI#]; accepted, awaiting publication; submitted, under review; other); acknowledgement of federal support (yes/no).

Hui Chen, Zhenqi Su, Bin Tian, Yang Liu, Yuhui Pang, Volodymyr Kavetskyi, Harold N. Trick and Guihua Bai. **2022**. Development and optimization of a *Barley stripe mosaic virus* (BSMV)-mediated gene editing system to improve Fusarium head blight (FHB) resistance in wheat. *Plant Biotechnology Journal* Jun; 20(6):1018-1020. doi: 10.1111/pbi.13819. Epub 2022 Apr 8.  
Acknowledgment of federal support - yes.

### Books or other non-periodical, one-time publications as a result of FY21 grant award

Report any book, monograph, dissertation, abstract, or the like published as or in a separate publication, rather than a periodical or series.

Identify for each one-time publication: Author(s); title; editor; title of collection, if applicable; bibliographic information; year; type of publication (book, thesis or dissertation, other); status of publication (published; accepted, awaiting publication; submitted, under review; other); acknowledgement of federal support (yes/no).

### Other publications, conference papers and presentations as a result of FY21 grant award

Identify any other publications, conference papers and/or presentations not reported above. Specify the status of the publication.