

FY21 Performance Progress Report**Due date:** July 26, 2022**Cover Page**

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Phone:	573-489-4920
Fiscal Year:	2021
USDA-ARS Agreement ID:	59-0206-1-205
USDA-ARS Agreement Title:	FHB Germplasm Research, Development, and Preservation in Winter Wheat
FY20 USDA-ARS Award Amount:	\$38,760
Recipient Organization:	University of Missouri Division of Plant Science 115 Business Loop 70 W, Mizzou North, Rm 501 Columbia, MO 65211
DUNS Number:	153890272
EIN:	43-6003859
Recipient Identifying Number or Account Number, if any:	
Project/Grant Period:	6/1/21 - 5/31/23
Reporting Period End Date:	5/31/2022

USWBSI Individual Project(s)

USWBSI Research Category*	Project Title	ARS Award Amount
EC-HQ	Preservation of Soft Red Winter Wheat FHB Germplasm at the University of Missouri	\$38,760
FY21 Total ARS Award Amount		\$38,760

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

July 27, 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: Preservation of Soft Red Winter Wheat FHB Germplasm at the University of Missouri

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

This project arose as a result of my retirement as wheat breeder at the University of Missouri and the subsequent (hopefully temporary) discontinuation of the wheat breeding program. During my tenure at MU and with the financial support of the USWBSI, I have primarily worked to incorporate, through conventional breeding, “native” resistances into Missouri soft red winter wheat varieties. The unique FHB resistance in most of the Missouri lines builds on the resistances in the Truman/Bess family, Ernie, and the MO 030291 family of lines (that includes MO 080104). These lines and others derived from them have been released from the Missouri Agricultural Experiment station either as public varieties with PVP or as licensed varieties and have been widely grown in Missouri and surrounding states. Several of our lines (Truman, Bess, Ernie) have also served as resistant check varieties in the Northern and Southern Uniform FHB Nurseries. The primary goal of this project was to increase and purify unreleased germplasm carrying FHB resistance and make that germplasm available to interested breeders within the USWBSI’s VDHR working groups for use as parents in their respective breeding programs. Within this overall goal during this period, I proposed to:

- a. Identify, catalogue, increase and purify superior FHB lines
- b. Build into the database, agronomic data across environments where available to include grain yield, test weight, maturity, height, where evaluated. We will then share that information with USWBSI breeders to inform their decision as to whether or not to use any of these lines in their breeding programs.

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?

Identify, catalogue, increase and purify superior FHB lines.

Approximately 160 germplasm lines, selected for FHB response and agronomic performance, were identified for a grow-out under greenhouse conditions. For each line, 20 plants were vernalized and planted. Off-types were identified and removed. Approximately 10 lines appeared to be segregating or were an ad hoc mixture and were therefore removed from further processing. Thus, 150 lines remained. For lines processed to date, thousand kernel weights averaged 33.5 g and total amounts of seed produced averaged 170 g / line.

b) What were the significant results?

Lines were successfully increased and purified. If this average persists, each breeder will have approximately 20 g of seed of requested lines. Surplus seed will be stored at the University of Missouri and in the Small Grains Collection in Aberdeen, Idaho

c) List key outcomes or other achievements.

Build into the database, agronomic data across environments where available to include grain yield, test weight, maturity, height, where evaluated. We will then share that with breeders for their input on which lines to distribute.

We have as list of designations, and pedigrees for lines increased as well as seed amounts available for each line. Over the remainder of the summer, we will be adding agronomic data for each germplasm line to further inform breeders of the value of lines to their specific breeding program.

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

None. This project is taking place as a result of my retirement. I have a full-time staff member working on the project with funding from the USWBSI supplemented with royalty funding that remains within the soft red winter wheat breeding program at the University of Missouri. No student labor was needed to complete the work.

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

As yet, results (seed) have not been disseminated. Most lines have been harvested from the greenhouse and the accompanying data base is being worked on through the remaining summer months. Once this is completed, aliquots of seed will be disseminated to interested breeders within the Northern Research Cap (where most lines are adapted and some have been tested), and to the Small Grains Collection in Aberdeen, Idaho. Remaining seed will be kept in the Missouri collection. Should individual breeders in the southern working group request seed, it will be shared based on the quantity of seed available.

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).

Due to the retirement of the PI – none during this period

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. Include any significant publication in the proceedings of a one-time conference or in the report of a one-time study, commission, or the like.

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).

Due to the retirement of the PI – none during this period

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.

Due to the retirement of the PI – none during this period