USDA-ARS/
U.S. Wheat and Barley Scab Initiative
FY11 Final Performance Report
July 13, 2012

Cover Page

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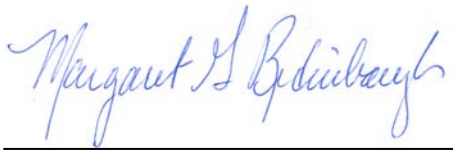
Fiscal Year:	FY11
USDA-ARS Agreement ID:	NA
USDA-ARS Agreement Title:	Evaluation of Fusarium Nurseries for Milling and Baking Quality.
FY11 USDA-ARS Award Amount:	$ 1,951

USWBSI Individual Project(s)

USWBSI Research Category*	Project Title	ARS Award Amount
VDHR-NWW	Coordinated Evaluation of FHB Resistance of Advanced Soft Winter Lines and Cultivars.	$ 1,951
	Total ARS Award Amount	**$ 1,951**



7/12/2012

Principal Investigator Date

* MGMT – FHB Management
FSTU – Food Safety, Toxicology, & Utilization of Mycotoxin-contaminated Grain
GDER – Gene Discovery & Engineering Resistance
PBG – Pathogen Biology & Genetics
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: *Coordinated Evaluation of FHB Resistance of Advanced Soft Winter Lines and Cultivars.*

1. **What major problem or issue is being resolved relevant to Fusarium head blight (scab) and how are you resolving it?**

   New breeding lines developed with resistance to *Fusarium* head blight must have adequate milling and baking quality if they are to be successfully released as finished cultivars for use by farmers. This project evaluates the quality of breeding lines targeted for *Fusarium* resistance at early stage, while they are in regional screening nurseries and provides that information back to breeders in a timely manner.

   A second problem concerns selection of breeding materials for crossing to develop the next cycle of resistant cultivars. By evaluating the regional nurseries, we allow breeders to effectively identify the lines with both desirable resistance and desirable milling and baking quality. The combination of information was not available previous to the grant and was a barrier to identifying optimum combinations of parents for developing viable commercial cultivars with *Fusarium* resistance.

2. **List the most important accomplishment and its impact (i.e. how is it being used) to minimize the threat of Fusarium head blight or to reduce mycotoxins. Complete both sections (repeat sections for each major accomplishment):**

   Accomplishment:

   The Southern Uniform Fusarium Head Blight Nursery and the Northern Uniform Winter Wheat Scab Nurseries were evaluated for milling and baking data and the data provided to breeders by December 1st in each year of the project. Evaluations were provided to breeders by the nursery coordinators as part of the nursery reports. The results were posted on the Soft Wheat Quality Laboratory website (http://www.ars.usda.gov/News/News.htm?modecode=36-07-05-00) and presented in a poster at the annual meetings of the USWBSI.

   Impact:

   Timely, accurate evaluations of milling and baking quality directly influences the decisions of most of the breeding programs participating in the CP. Long –term impact of the research will be shorter delivery time of improved cultivars with both target soft wheat quality and improved disease resistance.

Include below a list of the publications, presentations, peer-reviewed articles, and non-peer reviewed articles written about your work that resulted from all of the projects included in the grant. Please reference each item using an accepted journal format. If you need more space, continue the list on the next page.

Grybauskas, Y. Jin, J. Kolmer, J.P. Murphy, C. Sneller, and E. Souza. 2010. Registration of the soft red winter wheat germplasm MD01W233-06-1 resistant to Fusarium head blight. J. of Plant Registration 4: 255-260.

Balut, A, A, Clark, G. Brown-Guedira, E. Souza, and D. Van Sanford. 2010. Validation of *Fhb1* and *Qfhs.nau-2Dl* in several SRW wheat breeding populations. National Fusarium Head Blight Forum, Milwaukee WI, Dec. 2010. Proceedings p. 127.

Cardwell, L., E. Souza, G. Brown-Guedira, Y. Dong, and J. Costa. 2010. Evaluation of scab resistance and QTLs on agronomic and quality traits in soft red winter wheat. National Fusarium Head Blight Forum, Milwaukee WI, Dec. 2010. Proceedings p. 137.

Shoots, J., M. Guttieri1, F. Kolb, J. Lewis, A. McKendry, H. Ohm, C. Sneller, M.E. Sorrells, E. Souza, D. Van Sanford, J. Costa, C. Griffey, S. Harrison, J. Johnson and P. Murphy. 2010. Development and distribution of male-sterile facilitated recurrent selection populations. National Fusarium Head Blight Forum, Milwaukee WI, Dec. 2010. Proceedings p. 165.

Souza, E., H. Ohm, C.A. Griffey, and A Sturbaum. 2010. Milling and flour analysis of winter wheat genotypes in regional Fusarium nurseries. National Fusarium Head Blight Forum, Milwaukee WI, Dec. 2010. Proceedings p. 169.

Souza, E. 2010. Incorporating important biochemical attributes into breeding programs. Annual Meeting, Amer. Assoc. Cereal Chem. Intl. Savannah, GA. Oct. 2010. Cereal Foods World 55:A7.