USDA-ARS/
U.S. Wheat and Barley Scab Initiative
FY12 Final Performance Report
July 16, 2013

Cover Page

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Fiscal Year:	FY12
USDA-ARS Agreement ID:	59-0206-9-082
FY12 USDA-ARS Award Amount:	$ 5,848

USWBSI Individual Project(s)

USWBSI Research Category*	Project Title	ARS Award Amount
VDHR-SWW	Developing Double Haploids to Expedite Mapping and Enhance FHB Resistance in SRWW.	$ 5,848
	Total ARS Award Amount	**$ 5,848**

7/16/13

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: *Developing Double Haploids to Expedite Mapping and Enhance FHB Resistance in SRWW.*

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

   Developing wheat varieties that combine resistance to FHB with the yield potential of currently grown varieties remains a bottleneck for plant breeders. Through the work of the USWBSI, breeding lines are now available which are adapted, have competitive yield and contain known genes for resistance to FHB. Utilizing double haploids for wheat inbred line production can reduce the breeding process by 5-7 years compared to traditional inbreeding. With respect to the USWBSI, utilizing double haploids allows for combining multiple resistance genes together in an adapted background in the shortest amount of time possible, resulting in the highest probability for developing FHB resistant varieties.

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:

   F_1 seed from the cross AR01040-4-1/NC08-21273 was sent to Heartland Plant Innovations (Manhattan, KS) for double haploid production. NC08-21273 contains the *FHB_5A_Ernie* gene for FHB resistance. AR01040-4-1 is moderately resistant to FHB (unknown source), has excellent yield potential in Arkansas and the surrounding states and contains important genes for rust resistance (*Sr24/Lr24* and *Yr17/Lr37/Sr38*) which are important for a variety to be competitive in the region. Both lines are homozygous for *Rht_B1*.

   Impact:

   Double haploid lines developed from this cross and other crosses within the USWBSI will be cooperatively phenotyped throughout the region in order to identify those lines having a combination of FHB resistance and high yield potential that can be released as varieties.

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.

Kelley, J.P., **Mason, E**., Miller, R., **Milus, E.A**., Moon, D., and Rohman, P. 2012. Wheat Update 2012. U of A Cooperative Extension Service Publication. 16 pages. (includes scab ratings for cultivars).

Milus, E. A., Harrison, S. A., and **Mason, R. E**. 2012. Catbird as a source of resistance to Fusarium head blight. Page 16 in: Proceedings of the 4th International Symposium on *Fusarium* Head Blight. Nanjing, China.