

**USDA-ARS/
U.S. Wheat and Barley Scab Initiative
FY13 Final Performance Report
July 15, 2014**

Cover Page

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Fiscal Year:	FY13
USDA-ARS Agreement ID:	59-0206-9-053
USDA-ARS Agreement Title:	Management of Fusarium Head Blight of Wheat in Maryland.
FY13 USDA-ARS Award Amount:	\$ 15,781

USWBSI Individual Project(s)

USWBSI Research Category*	Project Title	ARS Award Amount
MGMT	Integrated Management of Fusarium Head Blight in Maryland.	\$ 15,781
	FY13 Total ARS Award Amount	\$ 15,781

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: *Integrated Management of Fusarium Head Blight in Maryland.*

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

The search for management tactics that can protect producers from the losses in yield and mycotoxin contamination associated with Fusarium head blight has taken great strides forward with the development of cultivars with moderate resistance and the registration of two triazole fungicides, Prosaro® and Caramba®. However, neither resistance nor fungicide application independently, has proved to be adequate in seasons highly favorable for disease development. Furthermore, some of the more highly resistant cultivars have had lower yield potentials than other highly adapted but susceptible cultivars and thus lose favor among producers after seasons with low disease development. The effectiveness of the best available fungicides has been primarily tested with highly susceptible varieties and disease-conducive environments. Thus their overall contribution to and possible interaction as a management package is not adequately understood. An integrated approach primarily testing cultivars ranging from highly susceptible to moderately resistant combined with the best available fungicide is being tested and demonstrated in this project under various debris management and rotation schemes. Data was shared as part of a multi-state coordinated project.

2. List the most important accomplishments and their impact (i.e. how are they 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 environmental conditions were favorable for natural disease development at one location, and artificial inoculation was successful in providing good test conditions at other locations. In general, disease reductions were accomplished by both management tactics, resistance and fungicides. At moderate to low disease pressure the highest level of resistance was sufficient in reducing disease and vomitoxin levels without the addition of the fungicide tactic. Fungicides reduced disease and vomitoxin levels most dramatically on highly susceptible cultivars. However, the vomitoxin levels on highly susceptible cultivars regardless of fungicide use were in excess of 2 ppm and would typically be rejected at elevators and mills. The integration of fungicides with moderate resistance provided the greatest reduction of disease.

Impact:

The combination of resistance and fungicide treatment is currently necessary to manage FHB outbreaks to produce a saleable product. The management research, testing these combinations, has been instrumental in demonstrating and providing hard evidence that neither tactic alone is adequate in a severe epidemic year. Best management of FHB will require a pre-season decision to select a cultivar with resistance to FHB and an in-season fungicide treatment based on disease potential and disease-conducive weather.

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 FY13 grant. Please reference each item using an accepted journal format. If you need more space, continue the list on the next page.

Grybauskas, A. P. 2013. Wheat Scab Management. Presentations made at Queen Anne County Agronomy Day, Frederick and Montgomery County Agronomy Day and Maryland Crop Improvement sponsored Field Day at Mercer's Seed Production Facility.