

**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:	59-0206-2-085
USDA-ARS Agreement Title:	Integrated Management and Prediction of Fusarium Head Blight and DON in Winter Wheat.
FY13 USDA-ARS Award Amount:	\$ 7,303

USWBSI Individual Project(s)

USWBSI Research Category*	Project Title	ARS Award Amount
MGMT	Integrating Strategies to Mitigate Fusarium Head Blight and DON in Winter Wheat.	\$ 7,303
	FY13 Total ARS Award Amount	\$ 7,303



Principal Investigator

July 14, 2014

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: *Integrating Strategies to Mitigate Fusarium Head Blight and DON in Winter Wheat.*

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

The major problem being resolved is to more effectively manage Fusarium head blight (FHB, scab) and deoxynivalenol (DON) in winter wheat through integration of management strategies. In 2013, we compared the effect of a fungicide (Prosaro = prothioconazole + tebuconazole) application at early flowering to no fungicide application in four winter wheat cultivars with different levels of resistance to FHB (Overley, 2137, Harry, and Overland). The four cultivars were planted in the fall of 2012 on ground infested with chopped corn stalks. In the spring of 2013, corn-kernel inoculum of *Fusarium graminearum* was additionally applied to the soil surface of all plots. At early flowering, each cultivar was spray-inoculated with spores of *F. graminearum* (100,000 spores/mL, Inoculated treatment) or not spray-inoculated (Non-inoculated treatment) 24 hours after 6.5 fl oz of Prosaro was applied or not applied to plots of all four cultivars. Data on FHB index, DON, *Fusarium*-damaged kernels (FDK), and yield were obtained from the plots.

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:

Regardless of spray-inoculation treatment, the FHB-susceptible cultivar Overley had the highest disease index, DON and FDK followed by 2137, also FHB-susceptible. The moderately resistant cultivars Overland and Harry had the lowest disease index. However, Harry had higher FDK and accumulated higher amounts of DON than Overland. Within each cultivar, the Prosaro-treated plots yielded higher and had lower disease index, DON, and FDK. Overall, Prosaro-treated Overland had the lowest disease index, DON, and FDK.

Impact:

The research demonstrated that combining resistance and fungicide application was more effective in controlling FHB and DON than using either strategy alone. Data from the research will enable growers to choose the combination of cultivar and fungicide application that will be most effective in reducing FHB and DON. Losses from FHB and DON will be reduced and profits for growers will increase.

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.

Hernandez Nopsa, J. F., S.N. Wegulo, A. Panthi, H.E. Hallen-Adams, S. D. Harris, and P. S. Baenziger. 2014. Characterization of Nebraska isolates of *Fusarium graminearum* causing head blight of wheat. *Crop Sci.* 54:310-317.

Panthi, A., H. Hallen-Adams, S. N. Wegulo, J. Hernandez Nopsa, and P. S. Baenziger. 2014. Chemotype and aggressiveness of Nebraska isolates of *Fusarium graminearum*. *Can. J. Plant Pathol.* Accepted.