

**USDA-ARS/
U.S. Wheat and Barley Scab Initiative
FY08 Final Performance Report (approx. May 08 – April 09)
July 15, 2009**

Cover Page

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Fiscal Year:	2008
USDA-ARS Agreement ID:	59-0790-4-095
USDA-ARS Agreement Title:	Diagnostic Services for Vomitoxin (DON) in Wheat.
FY08 USDA-ARS Award Amount:	\$ 76,628

USWBSI Individual Project(s)

USWBSI Research Category*	Project Title	ARS Adjusted Award Amount
FSTU	Diagnostic Service for Vomitoxin (DON)in Wheat.	\$76,628
	Total Award Amount	\$ 76,628

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
HWW-CP – Hard Winter Wheat Coordinated Project
VDHR – Variety Development & Uniform Nurseries – Sub categories are below:
 SPR – Spring Wheat Region
 NWW – Northern Winter Wheat Region
 SWW – Southern Sinter Wheat Region

Project 1: *Diagnostic Service for Vomitoxin (DON) in Wheat.*

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

The focus of the U.S. Wheat and Barley Scab Initiative (USWBSI) is to reduce *Fusarium* Head Blight (FHB) or scab in wheat and barley. *Fusarium* fungi can produce a variety of secondary metabolites or mycotoxins, including deoxynivalenol (DON) or vomitoxin. Analysis of DON in grain is an indicator of *Fusarium* infections. DON concentrations in wheat and barley can exceed recommended guidelines for grain use and render the cereals as unacceptable for processing into foods or animal feeds. The grant provided DON analyses of samples for numerous research scientists involved in projects for the USWBSI.

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 USWBSI research scientists directly benefit from analytical identification and quantitation of DON in their research cereal samples. Knowledge of mycotoxins, specifically vomitoxin, in research plants or cereal grains yields important data for controlling *Fusarium* growth and mycotoxin production in specific research projects that will ultimately benefit the plant producers and consumers.

The laboratory completed vomitoxin analyses on ~ 11,500 ground feed samples. The samples were submitted from 23 scientists in seven states, including North and South Dakota, Nebraska, Kansas, Missouri, North Carolina, and Montana. The laboratory also provided multiple *Fusarium* mycotoxin screen on ~10 grain samples and used the screen for quality assessment on control pool cereal samples. In addition to our in-house quality control, the laboratory participated in the USDA, Neogen, and Barley & Malt (NDSU) proficiency check sample systems for quality control in vomitoxin analyses.

Impact:

Vomitoxin or DON analysis in wheat samples is a basic service to USWBSI plant scientists and provides data used for evaluating mitigation methods for *Fusarium* head blight. This information is transferred to plant breeders and producers for cultivation of cereals grains that are potentially more resistant to *Fusarium*. Knowledge of DON production in wheat research of plant scientists is important for evaluation of methods aimed at mitigating FHB in cereal crops.

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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.

Not applicable. All data generated for use by USWBSI researchers.

If your FY08 USDA-ARS Grant contained a VDHR-related project, include below a list all germplasm or cultivars released with full or partial support of the USWBSI. List the release notice or publication. Briefly describe the level of FHB resistance. If this is not applicable (i.e. no VDHR-related project) to your FY08 grant, please insert ‘Not Applicable’ below.

Not Applicable

PI: Mostrom, Michelle

Project: Diagnostic Service for Vomitoxin (DON)in Wheat.

**FY08 FPR – USWBSI ADDENDUM
DON Service Labs – Quality Control Data**

Insert below Quality Control Data/Results from the FY08 Award Period (May 08-May 09):

The table summarizes the in-house quality control data run with DON analyses. Three quality controls samples, wheat, barley and corn, are run with each analysis (n=185). A wheat blank is also run with each analysis. Individual quality control charts can be provided for each control pool.

	GC/ECD Front Detector			GC/ECD Back Detector		
	Wheat	Barley	Corn	Wheat	Barley	Corn
Data Points (n)	185	185	185	185	185	185
Mean (DON PPM)	1.0	2.7	4.5	1.0	2.8	4.6
Standard Deviation	0.12	0.27	0.33	0.13	0.29	0.37
CV	12.2%	9.8%	7.2%	13.2%	10.4%	8.0%