

**USDA-ARS/
U.S. Wheat and Barley Scab Initiative
FY09 Final Performance Report
July 15, 2010**

Cover Page

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Fiscal Year:	2009
USDA-ARS Agreement ID:	59-0206-9-067
USDA-ARS Agreement Title:	Diagnostic Services for Vomitoxin (DON) in Wheat.
FY09- USDA-ARS Award Amount:	\$ 82,224

USWBSI Individual Project(s)

USWBSI Research Category*	Project Title	ARS Adjusted Award Amount
FSTU	Diagnostic Services for Vomitoxin (DON) in Wheat.	\$ 82,224
	Total Award Amount	\$ 82,224

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 Winter Wheat Region
 SWW – Southern Sinter Wheat Region

Project 1: *Diagnostic Services 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 U.S. Wheat and Barley Scab Initiative's (USWBSI) main thrust is to reduce *Fusarium* Head Blight (FHB) or scab in wheat and barley. A primary outcome of reducing scab is minimizing *Fusarium* production of secondary metabolites or mycotoxins, including deoxynivalenol (DON) or vomitoxin in grain. Analysis of DON in grain yields a good indication 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 ~ 11,000 ground feed samples. The samples were submitted from 19 scientists in six states, including North and South Dakota, Nebraska, Kansas, Missouri, and Montana. The laboratory also provided multiple *Fusarium* mycotoxin screens using gas chromatography/mass spectrometry (included vomitoxin, 15- and 3-deoxynivalenol and nivalenol) on periodic samples for quality assessment of the gas chromatography results. In addition to our in-house quality controls of wheat, barley and corn incorporated into every batch analysis, 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.

FY09 (approx. May 09 – May 10)
PI: Mostrom, Michelle
USDA-ARS Agreement #: 59-0206-9-067

FY09 Final Performance Report

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.

PI: Mostrom, Michelle

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

**FY09 FPR – USWBSI ADDENDUM
DON Service Labs – Quality Control Data**

Insert below Quality Control Data/Results from the FY09 Award Period (May 09-May 10):

The table summarizes the in-house quality control data run with DON analyses. Three quality control samples wheat, barley and corn are run with each analysis. A wheat blank was also run with each analysis, n=184 , mean < 0.2 mg/kg or ppm.

	GC/ECD Front Detector			GC/ECD Back Detector		
	Wheat	Barley	Corn	Wheat	Barley	Corn
Data points (n)	184	184	184	172	172	172
Mean (DON ppm)	1.0	2.8	4.6	1.1	2.9	4.7
Standard Deviation	0.15	0.26	0.50	0.16	0.27	0.34
CV	14.8%	9.1%	10.8%	14.8%	9.1%	7.2%