USDA-ARS/
U.S. Wheat and Barley Scab Initiative
FY07 Final Performance Report (approx. May 07 – April 08)
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Cover Page

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Fiscal Year:	2007
USDA-ARS Agreement ID:	59-0790-4-129
USDA-ARS Agreement Title:	Diagnostic Services for DON.
FY07 ARS Award Amount:	$ 169,842

USWBSI Individual Project(s)

USWBSI Research Area*	Project Title	ARS Adjusted Award Amount
FSTU-S	Diagnositc Services for DON.	$169,842
	Total Award Amount	**$ 169,842**

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Principal Investigator Date

* CBCC – Chemical, Biological & Cultural Control
EEDF – Etiology, Epidemiology & Disease Forecasting
FSTU – Food Safety, Toxicology, & Utilization of Mycotoxin-contaminated Grain
GET – Genetic Engineering & Transformation
HGR – Host Genetics Resources
HGG – Host Genetics & Genomics
IIR – Integrated/Interdisciplinary Research
PGG – Pathogen Genetics & Genomics
VDUN – Variety Development & Uniform Nurseries

Project 1: *Diagnositc Services for DON.*

1. What major problem or issue is being resolved and how are you resolving it?

Our laboratory provided deoxynivalenol (DON) and related mycotoxin diagnostic services for Fusarium Head Blight (Scab) research projects conducted by 34 PIs in 14 states last year. The major issue that we dealt with was how to efficiently handle huge amounts of samples submitted by so many groups and ensure researchers to get their results in a timely manner. In general, we analyzed samples based on a first come, first served policy. In case we received large amounts of samples from a single group or received several submissions from different groups around same time, we contacted PI(s) about their desired dates of having DON results for each set of their samples and adjusted samples analysis schedules to make sure that each PI could receive their results in a reasonable time frame. By doing so, we were able to provide DON results to most PIs within one month after receiving their samples.

2. List the most important accomplishment and its impact (how is it being used?). Complete all three sections (repeat sections for each major accomplishment):

Accomplishment:

From May 2007 to April 2008, the Mycotoxin Diagnostic Laboratory at the University of Minnesota analyzed 29,217 samples, which was 2.1 times the number of samples analyzed last year (13,873) and 42.5% more than the estimate (20,500) presented in the proposal. The huge increase of samples reflected the great needs of DON analysis by the scab research community. The samples were submitted by 34 scab research groups from 14 states including Minnesota, Kansas, Michigan, New York, Arkansas, Indiana, South Dakota, Illinois, Kentucky, Louisiana, Ohio, North Carolina, Maryland, and Virginia. They included 20,299 regular mature grain samples (6-100 g) and 8,918 small size samples such as single kernels, single spikeletes, single heads, small stems, and fungal cultures extracts. The target toxins included DON, 15-Acetyl-DON, 3-Acetyl-DON, nivalenol and zearalenone. Ergosterol, a chemical marker for measuring fungal biomass, was also analyzed for some samples as requested by researchers.

Impact:

The DON data has been used in all areas of scab research. By analyzing mycotoxins, the project provided support to barley and wheat breeding programs to develop resistant varieties, and to researchers to study disease mechanisms and to develop effective and economical chemical and biological disease controls.

As a result of that accomplishment, what does your particular clientele, the scientific community, and agriculture as a whole have now that they didn't have before?:

Mycotoxin data provided to scab researchers by our laboratory gave researchers a means to evaluate the effectiveness of their efforts in fighting Fusarium Head Blight.

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.

Goswami, R. S.; Dong, Yanhong; Punja, Z. K. "Host range and mycotoxin production by *Fusarium equiseti* isolates originating from gindeng fields" *Can. J. Plant Pathol.* **2008**, 30, 155-160.

Jiang, Guo-Liang,; Dong, Yanhong; Shi, Jinrong; Ward, Richard W. "QTL analysis of resistance to Fusarium head blight in the novel wheat germplasm CJ 9306. II. Resistance to deoxynivalenol accumulation and grain yield loss" *Teror. Appl. Genet.*, **2007,** 115, 1043-1052.

Yu, J.-B.; Bai, G.-H; Zhou, W.-C.; Dong, Yanhong; Kolb, F. L. "Quantitative Trait Loci for Fusarium Head Blight Resistance in a Recombinant Inbred Population of Wangshuibai/Wheaton" *Phytopathology*, **2007**, 98, 87-94.

Kong, L.; Dong, Yanhong; Ohm, H. W. "Characterization of Resistance to Deoxynivalenol (DON) Accumulation in Different Wheat Lines" *Proceedings of the 2007 National Fusarium Head Blight Forum*, **2007,** 191.