USDA-ARS/
U.S. Wheat and Barley Scab Initiative
FY06 Final Performance Report (approx. May 06 – April 07)
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Cover Page

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Fiscal Year:	2006
USDA-ARS Agreement ID:	59-0790-4-129
USDA-ARS Agreement Title:	Diagnostic Services for DON.
FY06 ARS Award Amount:	$ 90,838

USWBSI Individual Project(s)

USWBSI Research Area*	Project Title	ARS Award Amount
FSTU-S	Diagnostic Services for DON.	$ 90,838
	Total Award Amount	**$ 90,838**

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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
PGG – Pathogen Genetics & Genomics
VDUN – Variety Development & Uniform Nurseries

Project 1: *Diagnostic Services for DON.*

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

Our laboratory provides mycotoxin diagnostic services for Fusarium Head Blight (scab) research projects conducted mainly in Minnesota as well as in other states in FY06.

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 June 2006 to May 2007, the Mycotoxin Diagnostic Laboratory at the University of Minnesota analyzed 13,873 samples, which is about 19.5% increase compared with last year and 11% more than the estimate presented in the proposal. The samples were submitted by 17 scab research groups from 8 states including Minnesota, Michigan, Louisiana, Indiana, South Dakota, Virginia, Kansas, and Idaho. They included 9,912 regular mature grain samples (6-100 g) and 3,961 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:

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 give them 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.

Mudge, Agnieszka M.; Dill-Macky, Ruth; Dong, Yanhong; Gardiner, Donald M.; White, Rosemary G.; Manners, John M. "A role for the mycotoxin deoxynivalenol in stem colonization during crown rot disease of wheat caused by *Fusarium graminearum* and *Fusarium pseudograminearum*" *Physiol Mol Plant Pathol*, **2006**, 69, 73-85.

Jiang, Guo-Liang; Dong, Yanhong; Lewis, Janet M.; Siler, Lee; Ward, Richard W. "Characterization of Resistance to *Fusarium graminearum* in a Recombinant Inbred Line Population of Wheat: Resistance to Fungal Spred, Mycotoxin Accumulation, and Grain Yield Loss, and Trait Relationships" *Crop Sci.*, **2006,** 46, 2590-2597.

Dill-Macky, Ruth; Mudge, Agnieszka M.; Dong,Yanhong; Manners, John M. "Systemic Colonization and Production of Deoxynivalenol throughout Wheat Plants Following Inoculation of Crown Tissue with *Fusarium graminearum*" *Proceedings of the 2006 National Fusarium Head Blight Forum*, **2006,** 45.

Yu, J.; Bai, G.; Zhou, W.; Dong, Yanhong; Kolb, F. L."QTLs for Three Types of Resistance to Fusarium Head Blight in a Wheat Population of Wangshuibai/Wheaton" *Proceedings of the 2006 National Fusarium Head Blight Forum*, **2006,** 127.