USDA-ARS/
U.S. Wheat and Barley Scab Initiative
FY07 Final Performance Report (May 07 – May 09)
No Cost Extension for FY08
July 15, 2009

Cover Page

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Fiscal Year:	2007
USDA-ARS Agreement ID:	59-0790-7-079
USDA-ARS Agreement Title:	Rapid, Multiplex Real-Time PCR Method for Detection, Identification and Quantification of Fusarium spp.
FY07 ARS Award Amount:	$ 35,010

USWBSI Individual Project(s)

USWBSI Research Area*	Project Title	ARS Adjusted Award Amount
FSTU-R	Rapid, Multiplex Real-Time PCR Method for Detection, Identification and Quantification of Fusarium spp.	$35,010
	Total Award Amount	**$ 35,010**

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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: *Transformation and Field Testing of Transgenic Barley Lines.*

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

   The major problem this project addresses is the lack of a species specific quantitative method to apply to any study evaluating *Fusarium* colonization of grain. We are currently optimizing real-time PCR conditions to be able to amplify and accurately quantify the targeted species in a multiplex set up.

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:

   Set backs – Dennis Tobias left NDSU. A graduate student was hired to replace Dennis. It has taken some time to get this person in place and to train.

   Adjustments – This grant has been leveraged into additional funding from the Anderson Grant program through NC-213 (http://www.oardc.ohio-state.edu/nc213/). This will ensure successful completion of the method development.

   Completed – The PCR methodology is complete for four of the five species targeted. One species required full development of PCR probes and primers as no prior research had been reported from which to base sequences; this process is almost complete. We have established fast and efficient DNA extraction protocols for grain.

   Yet to be done – The overall multiplexed method needs to be validated against naturally infected grain samples. We anticipate completion and submission for publication prior to the end of the year.

   Impact:

   There will be a method available to scientists involved with scab research to accurately quantify target *Fusarium* species in grain and potentially in other plant tissues.

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.

Tobias, D.J., A. Vashisht, A. Boddeda, C.E. Wolf-Hall and P.B. Schwarz. 2007. Development of a multiplex real-time PCR assay for rapid detection and quantification of *Fusarium* spp. in barley. Proceedings of the 2007 National Fusarium Head Blight (NFHB) Forum, December 2-4, 2007, The Westin Crown Center, Kansas City, Missouri. Page 14.

Journal article manuscript is in preparation and citation information will be forwarded to the USWBSI as soon as accepted.

If your FY07 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 FY07 grant, please insert 'Not Applicable' below.

Not Applicable