

**USDA-ARS/  
U.S. Wheat and Barley Scab Initiative  
FY11 Final Performance Report  
July 13, 2012**

**Cover Page**

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<b>Fiscal Year:</b>	FY11
<b>USDA-ARS Agreement ID:</b>	59-0206-1-117
<b>USDA-ARS Agreement Title:</b>	Structural and Functional Studies of Trichothecene Biosynthetic Enzymes.
<b>FY11 USDA-ARS Award Amount:</b>	\$ 48,228

**USWBSI Individual Project(s)**

<b>USWBSI Research Category*</b>	<b>Project Title</b>	<b>ARS Award Amount</b>
PBG	Development and Testing of Improved Enzymes for Transgenic Control of FHB.	\$ 48,228
	<b>Total ARS Award Amount</b>	<b>\$ 48,228</b>

  
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Principal Investigator

July 12, 2012  
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 Soft Winter Wheat Region  
    SWW – Southern Soft Red Winter Wheat Region

**Project 1:** *Development and Testing of Improved Enzymes for Transgenic Control of FHB.*

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

This project is directed towards developing improved enzymes that can mitigate or inactivate the trichothecene mycotoxins. These enzymes will be introduced first into barley and then into wheat to demonstrate if they can reduce the impact of Fusarium Head Blight.

**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 major accomplishment is the development of a more stable version of trichothecene 3-*O*-acetylase (TRI101) which is known to be ~70 times more active towards DON than enzymes that have previously been introduced into wheat and barley. This enzyme is being transferred into barley for in vivo testing of its efficacy. In addition a screen for trichothecene biodegradative enzymes has been developed which is being used to identify bacterial enzymes that detoxify DON by deepoxidation to form deepoxy-4-deoxynivalenol.

**Impact:**

This approach may establish the feasibility of generating GM barley and wheat that are resistant to FHB

FY11 (approx. May 11 – May 12)

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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.**

None