

**USDA-ARS/
U.S. Wheat and Barley Scab Initiative
FY05 Final Performance Report (approx. May 05 – April 06)
July 14, 2006**

Cover Page

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Fiscal Year:	2005
FY05 ARS Agreement ID:	59-0790-4-122
Agreement Title:	Malting Barley Deoxynivalenol Diagnostic Services.
FY05 ARS Award Amount:	\$ 156,025

USWBSI Individual Project(s)

USWBSI Research Area*	Project Title	ARS Adjusted Award Amount
FSTU	Malting Barley Deoxynivalenol Diagnostic Services.	\$ 156,025
	Total Award Amount	\$ 156,025

Principal Investigator

Date

* BIO – Biotechnology
CBC – Chemical & Biological Control
EDM – Epidemiology & Disease Management
FSTU – Food Safety, Toxicology, & Utilization
GIE – Germplasm Introduction & Enhancement
VDUN – Variety Development & Uniform Nurseries

Project 1: *Malting Barley Deoxynivalenol Diagnostic Services.*

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

Mycotoxin analyses are essential for most researchers working on FHB of cereals. However, in barley DON is a major economic factor, and new varieties must display increased resistance to DON accumulation as well as to FHB. Screening barley lines for DON is requisite for any breeding program intending to develop varieties for the upper Midwestern USA. DON analytical services are provided to nine collaborating researchers within four barley varietal developmental programs. These programs stated a need for the analysis of approximately 10,000 samples in FY05. The major issue is to provide DON analytical services in a cost effective, timely and accurate manner. Funds provided by the USWBSI have allowed us to hire additional personnel and to subsidize the cost of analysis.

**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:

Approximately 9,000 samples from barley varietal development programs were analyzed. in FY05. An additional 1050 samples were analyzed for barley FHB research projects. Approximately 330 samples were analyzed as part of the 2005 regional barley crop quality survey. DON levels were the highest observed in the region since 1997. The 2005 samples were analyzed between August, 2005 and March, 2006.

Impact:

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?:

The analysis of DON in barley breeder's materials is absolutely essential in achieving the goal of new varieties that display reduced levels of DON accumulation. Research projects focusing on control of FHB and DON may provide short-term solutions for the utilization of FHB-contaminated barley. Monitoring DON levels in regional grain (crop survey) is important in maintaining food and feed safety, and also helps to maintain an epidemiological record of FHB on barley in the upper Midwest. This data is important to producers and users of regional grain, pathologists, agricultural economists, and to regulatory agencies.

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.

Horsley, R.D. Schmierer, D. Maier, C., Kudrna, D. Urrea, C., Steffenson, B.J., Schwarz, P.B., Franckowiak, J.D., Green, M., Zhang, B., Kleinhofs, A. Identification of QTLs associated with Fusarium Head Blight resistance in barley accession CIho 4196. *Crop Sci.* 2006 46: 145-156, 2006.

Schwarz, P.B., Horsley, R.D., Steffenson, B.J., Salas, B., and Barr., J.M. Quality risks associated with the utilization of Fusarium Head Blight infected malting barley. *J. Am. Soc. Brew. Chem.* 64(1):1-7, 2006.

Urrea, C.A., Horsley, R.D., Steffenson, B.J., and Schwarz, P.B. Agronomic characteristics, malt quality, and disease resistance of barley germplasm lines with partial Fusarium Head Blight resistance. *Crop Sci.* 2005 45: 1235-1240, 2005.

Kottapalli, B., Wolf-Hall, C.E., and Schwarz, P.B. Evaluation of gaseous ozone and hydrogen peroxide treatments for reducing Fusarium survival in malting barley. *J. Food Prot.* 68 (6):1236-1240, 2005.