# USDA-ARS/U.S. Wheat and Barley Scab Initiative FY13 Final Performance Report

**July 15, 2014**

## Cover Page

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Institution:</td>
<td>University of Missouri</td>
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</table>
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| Fiscal Year:  | FY13                  |
| USDA-ARS Agreement ID: | 59-0206-9-078 |
| USDA-ARS Agreement Title: | Managing FHB Through Integrated Practices and within-field Inoculum Sources. |
| FY13 USDA-ARS Award Amount: | $11,685 |

## USWBSI Individual Project(s)

<table>
<thead>
<tr>
<th>USWBSI Research Category*</th>
<th>Project Title</th>
<th>ARS Award Amount</th>
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<tbody>
<tr>
<td>MGMT</td>
<td>Evaluation of Integrated Management Strategies for Fusarium Head Blight.</td>
<td>$11,685</td>
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**FY13 Total ARS Award Amount**

$11,685

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

This research project addresses the need of identifying the best management methods for FHB/DON or good farming practices for FHB/DON management through integrated management studies. Needs addressed also include the evaluation of potential disease reductions through combinations of host resistance and fungicides, the documentation of the impact of crop sequence on disease risk and its potential role as part of the integrated management of FHB/DON and the development of outreach materials and opportunities for exchange of information with clientele.

The proposed research project very clearly mirrors Goal #1 of the FHB Management Action Plan, i.e. “Validate integrated management strategies for FHB and DON”. It also contributes to the goals of developing the next generation of management tools for FHB/DON control and enhancing communication and end used education/outreach by providing valuable research results on best management practices to clientele.

2012-2013 was the seventh year for the Integrated Management of Fusarium Head Blight and Deoxynivalenol study in Missouri. The recommended treatments were applied to five soft red winter wheat varieties. Ratings were made at the appropriate times and data for the seven years of the study has been analyzed and summarized.

2. **List the most important accomplishments and their impact (i.e. how are they being used) to minimize the threat of Fusarium Head Blight or to reduce mycotoxins. Complete both sections; repeat sections for each major accomplishment:**

**Accomplishment:**

Weather conditions were conducive for the development of FHB in all five varieties in both crop sequence trials during the 2012 season. In the corn residue trial all main and interaction effects were statistically significant for both yield and DON. Yields in the corn residue were lower than in the soybean residue and DON levels were higher in the corn residue than in the soybean residue. These results confirm the importance of crop rotation and variety selection as management tools for both FHB and DON. Fungicide application improved yield and reduced DON levels with a greater impact on moderately resistant varieties.

**Impact:**

This research has shown the importance of crop sequence or residue type on the level of FHB and DON in the subsequent wheat crop. Crop rotation as a management tool for both FHB and DON management needs to be stressed. In general, the greatest reductions in FHB intensity and DON accumulation were observed when moderately resistant varieties were used with crop rotation and fungicide application. Resistant varieties had lower levels of
both FHB and DON in both residue types and with or without fungicide application. Under high disease pressure, a three tier management approach of crop rotation with a non-host, moderately resistant to resistant varieties and fungicide application was required to achieve < 2ppm DON.

This research project has provided data that can be used by producers to manage both FHB and DON levels in wheat. The importance of crop rotation, variety selection and the use of fungicide applications as the wheat flowers if weather conditions are conducive to the development of FHB are viable options for producers trying to manage FHB and reduce DON levels.

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 FY13 grant. Please reference each item using an accepted journal format. If you need more space, continue the list on the next page.

**Proceedings:**


**Extension Manuals:**

**2013 Newsletter Articles:** All articles published in the University of Missouri’s Integrated Pest and Crop Management Newsletter, V. 23. Similar contributions made in previous years.
Sweets, L. E. Check wheat fields for early season diseases- March 29
Sweets, L.E. Continue checking for wheat diseases- May 31
Sweets, L.E. Black wheat heads- June 28
Sweets, L.E. Seed-borne wheat diseases to consider before using saved seed for planting this fall- July 31

(Form – FPR13)