**USDA-ARS/**
**U.S. Wheat and Barley Scab Initiative**
**FY12 Final Performance Report**
**July 16, 2013**

# Cover Page

| | |
|---|---|
| **PI:** | Shawn Conley |
| **Institution:** | University of Wisconsin |
| **Address:** | Dept. of Agronomy<br>1575 Linden Dr.<br>Madison, WI 53706 |
| **E-mail:** | spconley@wisc.edu |
| **Phone:** | 608-62-7975 |
| **Fax:** | |
| **Fiscal Year:** | FY12 |
| **USDA-ARS Agreement ID:** | 59-0206-1-117 |
| **Grant Title:** | Integrated Management Studies to Improve Overall Management of FHB and DON in Wisconsin. |
| **FY12 USDA-ARS Award Amount:** | $ 12,184 |

**USWBSI Individual Project(s)**

| USWBSI Research Category* | Project Title | ARS Award Amount |
|---|---|---|
| MGMT | Uniform Fungicide Trials for Management of FHB and DON in Wisconsin. | $ 4,874 |
| MGMT | Integrated Management of Fusarium Head Blight and DON in Wisconsin. | $ 7,310 |
| | **Total ARS Award Amount** | **$ 12,184** |

Principal Investigator 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:** *Uniform Fungicide Trials for Management of FHB and DON in Wisconsin.*
**Project 2:** *Integrated Management of Fusarium Head Blight and DON in Wisconsin.*

Since these projects are so closely tied to one another I have reported on them together.

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

Based on discussion with our key stakeholders, including growers, consultants, and the Wisconsin Crop Improvement Association (our main entity that certifies seed in the state), the primary questions being faced in Wisconsin include if and when a fungicide may be needed for control of scab. Many of the growers recognize the wheat varieties that are favorable for other traits like yield or resistance to foliar diseases may be more susceptible to scab when conditions are favorable. Therefore, understanding what factors should be examined to better manage the disease is critical. Given that we do not have a defined wheat breeder in Wisconsin, one of our approaches has been to develop an approach to using the Wisconsin Winter Wheat Performance Testing program that "mimics" a screening approach from the breeding side. The Wisconsin Winter Wheat Performance Testing program has 4 testing sites across WI that are subject to diverse climates. These sites are screened and rated for FHB. One of the weaknesses we do have in this approach is the inability to obtain mycotoxin testing results. We do not currently feel we could increase fees for varieties entered without the loss of participation in the program by the commercial wheat seed industry.

Another area that is a key component to our current USWBSI project is the question about the effect of crop rotation on the risk of scab. We have seen in our own long-term crop rotation studies at Arlington, WI significant increases in yield when we apply foliar fungicides (Proline or Prosaro) at flowering in wheat that follows corn for silage. We have also heard reports of such responses in grower fields. Our approach to such a question is multi-faceted as we continue our trials at Arlington, WI and have also expanded this to look at the distribution of *Fusarium* spp. across different rotations and management practices. A M.S. student is currently developing two manuscripts on this research.

As illustrated above one of the central tenets that we have recognized in Wisconsin is the need to integrate more fully in the projects affiliated with the USWBSI especially to improve stakeholder knowledge. Our approach has been proactive in the educational aspect for understanding management decisions related to scab. We developed a blog format to provide real-time observations and information about wheat production, wheat diseases and management (this blog does also discusses issues related to soybean production). In addition, Dr. Damon Smith recently joined the faculty in the Department of Plant Pathology at The University of Wisconsin-Madison and maintains a website that is updated regularly which has a section on wheat diseases including FHB.

**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:**

1) Provide commentary for the Fusarium Head Blight Prediction Center.
2) Established scab-specific research trials.
3) *Fusarium* spp manuscripts in preparation.

**Impact:**

**1) Provide commentary for the Fusarium Head Blight Prediction Center.**
Wisconsin joined the list of state's providing commentary for the prediction website. In addition to commentary, we actively provided training on how to use the site. Based on comments, we have been told many look at this as a method to monitor for scab in their areas of Wisconsin, especially to determine if fungicides are needed.

**2) Established scab-specific research trials.**
By participating in scab-specific trials, we have been able to develop a framework to improve management recommendations based on variety selection and the need for a foliar fungicide spray. This information is integrated with results from our Winter Wheat Performance Tests.

**3) *Fusarium* spp manuscripts in preparation.**
Two manuscripts are being prepared for publication

1. Quantify the effect of crop rotation and management on *Fusarium spp* diversity and population dynamics
2. Quantify the effect of crop rotation and management on winter wheat yield and quality (deoxynivalenol, DON).

**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.**

Web Resources (Extension):
The Soy Report Blog, http://thesoyreport.blogspot.com (used to provide real-time observations on FHB risk, etc.)

Extension Presentations:

1. 2012 Wheat Update and Soybean Seed Treatment Profitability (57 clients)
2. Rotation and management impact on Fusarium species (177 clients)
3. Soybean and Wheat Management (52 clients)
4. Wheat Diseases: Wisconsin CCA Training (20 clients)

Extension Articles or Publications:

1. Conley, S.P. 2012. Chilton wheat and FHB (scab) prediction maps. WCM: 20-14.
2. Conley, S.P. 2012. Fusarium Head Blight Risk Remains Low for WI. WCM: 19-9.
3. Conley, S.P. 2012. Looking Ahead – Early Scab Forecast and Fungicide Labels. WCM: 19-8.
4. Conley, S.P. 2012. Wheat Scouting Update and Disease Thresholds. WCM: 19-6.
5. Smith, D.L. 2013. Disease Profile: Fusarium head blight (scab) of wheat. Website profile. http://fyi.uwex.edu/fieldcroppathology/
6. Smith, D.L. 2013. Using Fungicides on Wheat. WCM: 20-3.

Conference Proceedings:

7. Marburger, D, Ane, J.M., and Conley, S.P. 2012. Effect of Crop Rotation and Management On Fusarium Spp. Diversity. In Agronomy Abstracts. ASA, Madison, WI.
8. Esker, P. and Conley, S.P. 2011. Pairing genetics and fungicides in wheat production. Proc. Wisc. Fert. Aglime Pest Management Conf. 50:89.

Research publications:

9. Lackermann. K.V., Conley, S. P., Martinka, M., and Gaska, J., and Esker, P.D.. 2011. Effect of location, cultivar and disease severity on grain yield of soft red winter wheat in Wisconsin. Plant Disease: 95:1401-1406.