Project FY22-FS-002: Diagnostic Services for DON

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1. **What are the major goals and objectives of the research project?**
   The goal of this project is to provide rapid, cost-effective, and accurate mycotoxin analysis, especially deoxynivalenol (DON), for Fusarium Head Blight (FHB or scab) research projects.

2. **What was accomplished under these goals or objectives?** *(For each major goal/objective, address these three items below.)*

   What were the major activities?
   Analyzed DON and related mycotoxins, such as 15-Acetyl-DON, 3-Acetyl-DON and Nivalenol, in wheat, barley and fungal culture extract using GC-MS and prepared purification columns.

   What were the significant results?
   From May 1, 2024, to April 30, 2025, our laboratory analyzed 22,018 samples submitted by 38 research groups from 21 states including Arkansas, Georgia, Idaho, Indiana, Illinois, Kansas, Kentucky, Louisiana, Maryland, Michigan, Minnesota, Missouri, Montana, New York, North Carolina, North Dakota, Ohio, Pennsylvania, South Dakota, Texas, and Wisconsin. The samples included 20,769 regular mature grain samples (4 -100 g) and 1,249 small size samples such as grain samples less than 4 g (1,213), and fungal culture extracts (36). The target toxins included DON, 15-Acetyl-DON, 3- Acetyl-DON, and nivalenol.

   List key outcomes or other achievements.
   The DON data has been used in all areas of scab research. By analyzing mycotoxins, the project provided support to barley and wheat breeding programs to develop resistant varieties, and to researchers to study disease mechanisms and to develop effective chemical and biological disease controls. Mycotoxin data provided to scab researchers by our laboratory gave them a means to evaluate the effectiveness of their efforts in fighting Fusarium Head Blight

3. **What opportunities for training and professional development has the project provided?**
   Provided fund for PI, Yanhong Dong, to attend the 2024 National FHB Forum held in Austin, TX between December 8-10, 2024.

4. **How have the results been disseminated to communities of interest?**
   The results were emailed to researchers and were then disseminated to communities of interest via conference papers and presentations, and journal publications.

5. **What do you plan to do during the next reporting period to accomplish the goals and objectives?**
   The practices in our lab have been proven being successful in supporting the FHB research projects. We will continue to do the same.

FY24 Annual DON Lab Report on Sample Numbers

Please complete the following required data points for your DON lab analysis that took place during May 1, 2024 – April 30, 2025.

U.S. Wheat & Barley Scab Initiative

Detailed DON Lab PI Sample Result Breakdown

(additional rows can be added as needed)

Principal Investigator	Grain Class (*Indicate sample type: BAR, HRSW, HWW, SWW, DUR)	Institution	Allotment FY Budgeted #	# Samples Analyzed in FY	# Samples Ground by DON Lab
Ameen, Gazala	BAR	South Dakota State U	300	135	
Anderson, Jim	HRSW	U of Minnesota	1000	784	3
Bai, Guihua	HRWW	USDA-ARS, KS	200	195	
Bish, Mandy	SRWW	U of Missouri	192	192	
Bradley, Carl	BAR, SRWW	U of Kentucky	676	649	649
Brown-Guedira, Gina	HRWW	USDA-ARS, NC	0	120	
Chilvers, Martin	BAR, SWWW	Michigan State U	260	258	
Cowger, Christina	BAR	USDA-ARS, NC	519	386	
Crutcher, Frankie	Bar, DUR	Montana State U	1075	955	
DeWolf, Erick/Onofre, Kelsey Andersen	HRWW	Kansas State U	530	390	
Dill-Macky, Ruth	HRSW	U of Minnesota	50	33	
Elias, Elias	DUR	North Dakota State U	1000	1046	
Elmore, Mitch	Cultural extract	USDA-ARS, MN	0	36	
Esker, Paul/Collins, Alyssa	BAR, SWWW	Pennsylvania State U	638	638	
Fritz, Allan	HRWW	Kansas State U	1100	829	1
Green, Andrew	HRSW	North Dakota State U	1000	1003	
Harrison, Stephen/Padgett, Boyd	SRWW	Louisiana State U Ag. Center	1930	1889	4
Liu, Shuyu	SWWW	Texas A&M U	226	226	
Mason, Esten		Colorado State U	300	0	
Marshall, Juliet	BAR, HRSW, HWSW, SWSW, SWWW, HWWW, HRWW	U of Idaho	764	950	1
Mergoum, Mohamed	SRWW	U of Georgia	500	192	
Mideros, Santiago		U of Illinois at Urbana Champaign	96	0	
Mohammadi, Mohsen	HRSW, SSW	Purdue U	200	168	
Muehlbauer, Gary		U of Minnesota	300	0	
Olson, Eric	SRWW	Michigan State U	438	362	
Paul, Pierce	SRWW	Ohio State U	250	234	
Price, Trey	HRWW	Louisiana State U Ag. Center	424	424	
Rawat, Nidhi/Tiwari, Vijay	SRWW, BAR	U of Marylan	2500	1712	
Rutkoski, Jessica	SRWW	U of Illinois at Urbana Champaign	1850	1817	
Shah, Jyoti (Vijee Mohan)		U of North Texas	450	0	
Shakiba, Ehsan	SRWW	U of Arkansas	1100	733	
Smith, Damon	SRWW	U of Wisconsin-Madison	200	174	
Smith, Kevin	BAR	U of Minnesota	600	764	
Sneller, Clay		Ohio State U	100	0	
Sorrells, Mark	SWWW, SRWW, HWWW	Cornell U	288	286	

Steffenson, Brian	BAR	U of Minnesota	850	1014	
Stockinger, Eric	BAR	Ohio State U	1000	999	
Telenko, Darcy	WWW	Purdue U	212	240	
Van Sanford, Dave	SRWW, BAR, Rye	U of Kentucky	2100	2158	
QA samples	BAR, Wheat	USWBSI/Trilogy	27	27	
Total			**25245**	**22018**	**658**

*BAR=Barley, HRSW=Hard Red Spring Wheat, HWW=Hard Winter Wheat, SWW=Soft Winter Wheat, DUR= Durum

TOTALS	**# Analyzed**
Total # Overall of Samples Analyzed	22018
Total # of Regular Grain Samples (4-100g)	20769
Total # of Small Grain Samples (<4g)	1213
Total # of Specialty Samples, please specify: Cultural extract	36
Total # of Specialty Samples, please specify:	
Total # of Specialty Samples, please specify:	

Target Toxins Analyzed

Check all analyzed:	**Toxin**	**# Analyzed**
☐	DON	**22018**
☐	DON3G	**0**
☐	15-Acetyl-DON	**22018**
☐	3-Acetyl-DON	**22018**
☐	Nivalenol	**22018**
☐	Zearalenone	**0**
☐	NX3	**0**
☐	Other, please specify:	

Annual DON Quality Control Data

Internal lab quality control data (separate QC from Trilogy)

	Check 1	**Check 2 (optional)**	**Check 3 (optional)**
N[a]	93	704	215
Mean (ppm)	7.59	6.13	7.84
SD[b]	0.47	0.55	0.97
%CV[c]	6.2	8.9	12.4

[a] Number of check samples. [b] Standard deviation. [c] Coefficient of variance

Return your completed report along with your annual Performance Report submission. Please direct any questions to the USWBSI Networking and Facilitation Office (NFO) at nfo@scabusa.org. Thank you!