USDA-ARS/
U.S. Wheat and Barley Scab Initiative
FY19 Annual Performance Progress Report - NCE
Due date: August 31, 2021

Cover Page

Principle Investigator (PI):	Richard Horsley
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Fiscal Year:	2019
USDA-ARS Agreement ID:	59-0206-7-155
USDA-ARS Agreement Title:	Deoxynivalenol (DON) Analysis in Wheat
FY19 USDA-ARS Award Amount:	$ 183,712
Recipient Organization:	North Dakota State University Office of Grant & Contract Accouting NDSU Dept 3130, PO Box 6050 Fargo, ND 58108-0650
DUNS Number:	80-388-2299
EIN:	45-6002439
Recipient Identifying Number or Account Number:	FAR0028208
Project/Grant Reporting Period:	8/1/19 - 7/31/21
Reporting Period End Date:	7/31/2021

USWBSI Individual Project(s)

USWBSI Research Category*	Project Title	ARS Award Amount
FST-S	Deoxynivalenol (DON) Analysis in Wheat	$ 183,712
	FY19 Total ARS Award Amount	**$ 183,712**

Kirk O. Horsley

Principal Investigator — 8/29/2021 Date

* MGMT – FHB Management
FST – Food Safety & Toxicology
R – Research
S – Service (DON Testing Lab)
GDER – Gene Discovery & Engineering Resistance
PBG – Pathogen Biology & Genetics
EC-HQ – Executive Committee-Headquarters
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: *Deoxynivalenol (DON) Analysis in Wheat*

1. **What are the major goals and objectives of the research project?**
   The goal of this project is to provide information to the wheat breeders, durum breeders, plant pathologists, ND wheat commodity groups, and other researchers working on developing Fusarium resistant cultivars and developing fungicide protocols, with DON analysis results that are timely and affordable.

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

   a) **What were the major activities?**
   Approximately 7,050 samples (exclusive of checks and standard curve samples) were analyzed for DON during the reporting period. Eighteen researchers from four US states (ND, SD, KS, MT) submitted the samples and the majority of them were from breeding programs. Some the samples were from pathologists and other researchers developing fungicide protocols.

   b) **What were the significant results?**
   Results for DON content of samples sent by cooperators were obtained and provided to the cooperators. The results were obtained for about 7,050 samples. Breakdown of samples are below:

		Samples		
Researcher	**University**	**Estimated**	**Submitted**	**Difference**
Byamukama	SDSU	1050	691	(359)
Chapara	NDSU	700	104	(596)
DeWolf	KS	664	180	(484)
Elias	NDSU	600	752	152
Friskop	NDSU	128	128	0
Giroux	MT	150	48	(102)
Glover	SDSU	1250	411	(839)
Green	NDSU	2000	2289	289
Kalil	NDSU		150	150
Marais	NDSU	300		(300)
Ransom	NDSU	600	367	(233)
Schatz	NDSU	386	220	(166)
Sehgal	SDSU	300	310	10
Talbert	MT	350	36	(314)
Wegulo/Baeziger	NE	800		(800)
Zhong Shaobin	NDSU	800	272	(528)
	TOTALS	**10078**	**5686**	**(4392)**

c) List key outcomes or other achievements.

The major outcome of this project for FY19 was that we were able to effectively analyze all of the samples sent by the 18 cooperators by the end of the FY19 funding term. We were able to catch up from our late start that occurred for our first year as part of the USWBSI and maintain progress allowing us to finish all analysis by the end of the funding term. The results were submitted to and accepted by all cooperators involved in USWBSI research.

3. Was this research impacted by the COVID-19 pandemic (i.e. university shutdowns and/or restrictions, reduced or lack of support personnel, etc.)? If yes, please explain how this research was impacted or is continuing to be impacted.

North Dakota State University took a proactive approach on liming University personnel and students to COVID-19 by going to an on-line classroom format for the students, closing the dormitories so most students left campus, and encouraging anyone that could work from home do so. Essential laboratories such as the USWBSI group could continue operation with one person in the lab at a time. Tasks that normally were done by two people working in tandem were curtailed and carried out many days by one person, so processing the samples slowed down considerably. Buildings were locked 24/7 so extra planning had to be done to allow students to come in and work on evenings and weekends, which was on a limited basis, as well as changes as to how we could receive mail and shipments. Some supplies that were shipped from MN, Canada, and Germany were stopped so that also caused delays. Extra cleaning and safety measures were implemented and we will be working with the extra safety measures for the next 6 months at least. Still only one person per laboratory.

4. What opportunities for training and professional development has the project provided?

One undergraduate and one scientist assist in the laboratory with the testing. The undergraduate student has learned basic laboratory skills and laboratory quality control.

5. How have the results been disseminated to communities of interest?

The data are provided directly to the researchers and commodity groups. Information on DON in wheat has been disseminated to the growers, breeders, and other scientists by written publications, conferences, and webinars.

Training of Next Generation Scientists

Instructions: Please answer the following questions as it pertains to the **FY19 award period (8/1/19 - 7/31/21)**. The term "support" below includes any level of benefit to the student, ranging from full stipend plus tuition to the situation where the student's stipend was paid from other funds, but who learned how to rate scab in a misted nursery paid for by the USWBSI, and anything in between.

1. **Did any graduate students in your research program supported by funding from your USWBSI grant earn their MS degree during the FY19 award period?**
   ☐Yes ☒No ☐ Not Applicable
   If yes, how many? Click to enter number here.

2. **Did any graduate students in your research program supported by funding from your USWBSI grant earn their Ph.D. degree during the FY19 award period?**
   ☐Yes ☒No ☐ Not Applicable
   If yes, how many? Click to enter number here.

3. **Have any post docs who worked for you during the FY19 award period and were supported by funding from your USWBSI grant taken faculty positions with universities?**
   ☐Yes ☒No ☐ Not Applicable
   If yes, how many? Click to enter number here.

4. **Have any post docs who worked for you during the FY19 award period and were supported by funding from your USWBSI grant gone on to take positions with private ag-related companies or federal agencies?**
   ☐Yes ☒No ☐ Not Applicable
   If yes, how many? Click to enter number here.

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Release of Germplasm/Cultivars

Instructions: In the table below, list all germplasm and/or cultivars released with full or partial support through the USWBSI during the **FY19 award period (8/1/19 - 7/31/21)**. All columns must be completed for each listed germplasm/cultivar. Use the key below the table for Grain Class abbreviations.

NOTE: Leave blank if you have nothing to report or if your grant did NOT include any VDHR-related projects.

Name of Germplasm/Cultivar	Grain Class	FHB Resistance	FHB Rating (0-9)	Year Released
N/A	Select Grain Class	Select what represents your most resistant check	Enter as text 0-9 rating	Select Year
Click here to enter text.	Select Grain Class	Select what represents your most resistant check	Enter as text 0-9 rating	Select Year
Click here to enter text.	Select Grain Class	Select what represents your most resistant check	Enter as text 0-9 rating	Select Year
Click here to enter text.	Select Grain Class	Select what represents your most resistant check	Enter as text 0-9 rating	Select Year
Click here to enter text.	Select Grain Class	Select what represents your most resistant check	Enter as text 0-9 rating	Select Year
Click here to enter text.	Select Grain Class	Select what represents your most resistant check	Enter as text 0-9 rating	Select Year
Click here to enter text.	Select Grain Class	Select what represents your most resistant check	Enter as text 0-9 rating	Select Year
Click here to enter text.	Select Grain Class	Select what represents your most resistant check	Enter as text 0-9 rating	Select Year
Click here to enter text.	Select Grain Class	Select what represents your most resistant check	Enter as text 0-9 rating	Select Year
Click here to enter text.	Select Grain Class	Select what represents your most resistant check	Enter as text 0-9 rating	Select Year
Click here to enter text.	Select Grain Class	Select what represents your most resistant check	Enter as text 0-9 rating	Select Year
Click here to enter text.	Select Grain Class	Select what represents your most resistant check	Enter as text 0-9 rating	Select Year
Click here to enter text.	Select Grain Class	Select what represents your most resistant check	Enter as text 0-9 rating	Select Year
Click here to enter text.	Select Grain Class	Select what represents your most resistant check	Enter as text 0-9 rating	Select Year

NOTE: List the associated release notice or publication under the appropriate sub-section in the 'Publications' section of the FPR.

Publications, Conference Papers, and Presentations

Instructions: Refer to the FPR_Instructions for detailed more instructions for listing publications/presentations about your work that resulted from all of the projects included in the FY19 grant award. Only citations for publications published (submitted or accepted) or presentations presented during the **award period (8/1/19 - 7/31/21**) should be included. If you did not publish/submit or present anything, state 'Nothing to Report' directly above the Journal publications section.

NOTE: Directly below each citation, you **must** indicate the Status (i.e. published, submitted, etc.) and whether acknowledgement of Federal support was indicated in the publication/ presentation. See example below for a poster presentation with an abstract:

Winn, Z.J., Acharya, R., Lyerly, J., Brown-Guedira, G., Cowger, C., Griffey, C., Fitzgerald, J., Mason R.E., and Murphy, J.P. (2020, Dec 7-11). Mapping of Fusarium Head Blight Resistance in NC13-20076 Soft Red Winter Wheat (p. 12). In: Canty, S., Hoffstetter, A. and Dill-Macky, R. (Eds.), *Proceedings of the 2020 National Fusarium Head Blight Forum*. https://scabusa.org/pdfs/NFHBF20_Proceedings.pdf.
Status: Abstract Published and Poster Presented
Acknowledgement of Federal Support: YES (Abstract and Poster)

Journal publications.

Nothing to report

Books or other non-periodical, one-time publications.

Nothing to report

Other publications, conference papers and presentations.

Nothing to report

PI: Horsley, Richard
Project: Deoxynivalenol (DON) Analysis in Wheat

FY19-NCE FPR – USWBSI ADDENDUM
DON Service Labs – Quality Control (QC) Data

Note: What is being requested is the across lab quality control data (separate QC from Trilogy).

Insert below Quality Control Data/Results from the FY19-NCE Award Period (8/1/19 - 7/31/21):

QC samples	Low PPM	Hi PPM
average	0.8	2.5
std dev	0.18	0.58
cv	22.5	23.2
low	0.62	1.92
hi	0.96	3.08
No.	160	160