USDA-ARS
U.S. Wheat and Barley Scab Initiative
FY18 Performance Report
Due date: July 12, 2019

Cover Page

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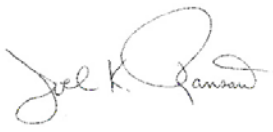
Fiscal Year:	2018
USDA-ARS Agreement ID:	59-0206-6-002
USDA-ARS Agreement Title:	Value of Genetic Resistance and Fungicides on FHB Control in Durum.
FY18 USDA-ARS Award Amount:	$ 10,500
Recipient Organization:	North Dakota State University Office of Grant & Contract Accouting NDSU Dept 3130, PO Box 6050 Fargo, ND 58108-0650
DUNS Number:	80-388-2299
EIN:	45-6002439
Recipient Identifying Number or Account Number:	FAR0025286
Project/Grant Reporting Period:	5/10/18 - 5/9/19
Reporting Period End Date:	05/09/19

USWBSI Individual Project(s)

USWBSI Research Category*	Project Title	ARS Award Amount
DUR-CP	Value of Genetic Resistance and Fungicides on FHB Control in Durum.	$ 10,500
	FY18 Total ARS Award Amount	$ 10,500



6/7/19

Principal Investigator Date

* MGMT – FHB Management
FST – Food Safety & Toxicology
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

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Project 1: *Value of Genetic Resistance and Fungicides on FHB Control in Durum.*

1. **What are the major goals and objectives of the project?**

   Controlling DON levels and FHB is more problematic in durum than in spring wheat due to the lack of high levels of genetic resistance to FHB in currently available durum cultivars. The objective of this research was to quantify the effect of currently available durum cultivars when combined with the best fungicide practice on the control of FHB and DON. This research was conducted under misted and inoculate conditions and under natural levels of inoculum and without misting. We also included a few promising advanced lines in order to get a larger plot view of their performance.

2. **What was accomplished under these goals?** *Address items 1-4) below for each goal or objective.*

   1) Major activities: Variety by fungicide trials were planted in REC Carrington under misting conditions and at Prosper under natural conditions.

   2) Specific objectives: To determine the relative importance of variety and fungicide on the control of FHB and level of DON in the grain at harvest.

   3) Significant results: At Carrington, even though plots were misted, DON levels were less than 2.4 ppm. Fungicide reduced DON levels from 1.5 ppm to 0.9 ppm when averaged over all of the genotypes. The best genotypes were new advanced lines. In the Prosper experiment, DON levels were actually higher than those obtained in the misted plots. DON was reduced by only 0.3 ppm when fungicide was applied, probably because FHB developed a few weeks after the fungicide application (later than normally expected). The two advanced lines mentioned above looked very promising (averaged about 2 ppm lower DON than most of the released cultivars, regardless of whether or not fungicide was applied.

   4) Key outcomes or other achievements: The information on the released varieties provided practical guidance to growers who have been seeing FHB damage more frequently in recent years, on the importance of combining genetic resistance with fungicides in order to obtain the best FHB control. It also provided reliable data on how the new lines are performing in a larger plot configuration.

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

   For a second year, five graduate students were trained in the how to evaluated FHB damage and in how to apply fungicides and evaluate their effectiveness (they were not funded by the Scab Initiative, but were active in the research as a member of the research team).

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

The results of this experiment were posted on the variety trial results section of the NDSU Extension Service's website (minus the coded lines). They were used to update variety information on the published durum variety selection guide, and were included in presentations made at several major meetings attended by growers and crop consultants.

Training of Next Generation Scientists

1. **Did any graduate students in your research program supported by funding from your USWBSI grant earn their MS degree during the FY18 award period?** No

2. **Did any graduate students in your research program supported by funding from your USWBSI grant earn their Ph.D. degree during the FY18 award period?** No.

3. **Have any post docs who worked for you during the FY18 award period and were supported by funding from your USWBSI grant taken faculty positions with universities?** No.

4. **Have any post docs who worked for you during the FY18 award period and were supported by funding from your USWBSI grant gone on to take positions with private ag-related companies or federal agencies?** No.

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 FY18 award period. 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** (S, MS, MR, R, where R represents your most resistant check)	**FHB Rating** (0-9)	**Year Released**

Add rows if needed.

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

Abbreviations for Grain Classes

Barley - BAR
Durum - DUR
Hard Red Winter - HRW
Hard White Winter - HWW
Hard Red Spring - HRS
Soft Red Winter - SRW
Soft White Winter - SWW

Publications, Conference Papers, and Presentations

Instructions: Refer to the FY18-FPR_Instructions for detailed instructions for listing publications/presentations about your work that resulted from all of the projects included in the FY18 grant. Only include citations for publications submitted or presentations given during your award period. If you did not have any publications or presentations, state 'Nothing to Report' directly above the Journal publications section.

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

> Conley, E.J., and J.A. Anderson. 2018. Accuracy of Genome-Wide Prediction for Fusarium Head Blight Associated Traits in a Spring Wheat Breeding Program. In: Proceedings of the XXIV International Plant & Animal Genome Conference, San Diego, CA.
> Status: Abstract Published and Poster Presented
> Acknowledgement of Federal Support: YES (poster), NO (abstract)

Journal publications.

Nothing to report.

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

Nothing to report.

Other publications, conference papers and presentations.

Kalil, A., D. Fonseka, T. Tjelde, J. Ransom, C. Deplazes, E. Bauske, J. Halvorson, S. Meyer, C. Schuh and A. Friskop. 2018. Evaluation of Fungicides Individually or as Part of an Integrated Approach for Management of Fusarium Head Blight in Durum. National Fusarium Head Blight Forum, p. 27.
Status: Abstract Published and Poster Presented
Acknowledgement of Federal Support: YES (poster), YES (abstract).t

Ransom, J.K., A. Friskop and R. Buetow. 2018. Variation in spike emergence timing in spring wheat varieties sown at different densities. National Fusarium Head Blight Forum. p. 37.
Status: Abstract Published and Poster Presented
Acknowledgement of Federal Support: YES (poster), YES (abstract).