

**USDA-ARS**  
**U.S. Wheat and Barley Scab Initiative**  
**FY19 Final Performance Report**  
**Due date: July 24, 2020**

**Cover Page**

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<b>Fiscal Year:</b>	2019
<b>USDA-ARS Agreement ID:</b>	59-0206-8-189
<b>USDA-ARS Agreement Title:</b>	Managing Fusarium and DON for Soft Winter Wheat in Michigan
<b>FY19 USDA-ARS Award Amount:</b>	\$ 21,981
<b>Recipient Organization:</b>	Michigan State University Contract & Grant Administration Hannah Administration Building, Room 2 East Lansing, MI 48824-1046
<b>DUNS Number:</b>	193247145
<b>EIN:</b>	38-6005984
<b>Recipient Identifying Number or Account Number:</b>	RC108940
<b>Project/Grant Reporting Period:</b>	6/1/19 - 5/31/20
<b>Reporting Period End Date:</b>	5/31/2020

**USWBSI Individual Project(s)**

<b>USWBSI Research Category*</b>	<b>Project Title</b>	<b>ARS Award Amount</b>
MGMT	Managing Fusarium and DON for Soft Winter wheat in Michigan	\$ 21,981
<b>FY19 Total ARS Award Amount</b>		<b>\$ 21,981</b>

*Martin Chilvers*

Principal Investigator

Jul-28-2020

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

**Project 1:** *Managing Fusarium and DON for Soft Winter wheat in Michigan*

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

1) *Develop integrated management strategies for FHB and mycotoxins that are robust to conditions experienced in production fields* and Goal 2) *Help develop and validate the next generation of management tools for FHB/DON control*". The research needs in the USWBSI Action plan addressed by the proposed research are: 1) Validate integrated strategies with the next generation of wheat varieties; 2) Evaluate the flexibility of fungicide application timing within the context of integrated management strategies; and 3) Enhance forecasting capabilities for FHB and continued development of FHB and DON models for wheat

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

a) What were the major activities?

Wheat and barley trials were conducted on two varieties each to determine optimal fungicide timing and fungicide efficacy for management of head scab. A second trial to examine fungicide efficacy was also conducted to compare products

b) What were the significant results?

Yes, results informed decision making for optimal fungicide timing and fungicide choice

c) List key outcomes or other achievements.

We are still awaiting DON data, but early indications from trials have confirmed that it is essential to make fungicide applications at the correct timing for optimal head scab control. Once we have DON data we will also be in a position to reevaluate fungicide efficacy tables and the potential value of split or double applications in minimizing scab. Variety effect again clearly demonstrated the importance of using IPM practices in reducing scab including variety selection and appropriate fungicide, rate and timing.

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

No, we were fortunate to complete our field trials as outlined in the proposal. However, we are now trying to determine how to process grain samples for DON analysis given the reduced sample processing at Univ. of Minn.

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

Nothing to report.

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

Nothing to report.

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## **Training of Next Generation Scientists**

**Instructions:** Please answer the following questions as it pertains to the FY19 award period (6/1/19 - 5/31/20). 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?**

No

**If yes, how many?**

- 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?**

No

**If yes, how many?**

- 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?**

No

**If yes, how many?**

- 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?**

No

**If yes, how many?**

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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. 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

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## **Publications, Conference Papers, and Presentations**

**Instructions:** Refer to the FY19-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 (6/1/19 - 5/31/20)** 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:

De Wolf, E., D. Shah, P. Paul, L. Madden, S. Crawford, D. Hane, S. Canty, R. Dill-Macky, D. Van Sanford, K. Imhoff and D. Miller. 2019. "Impact of Prediction Tools for Fusarium Head Blight in the US, 2009-2019." In: S. Canty, A. Hoffstetter, H. Campbell and R. Dill-Macky (Eds.), *Proceedings of the 2019 National Fusarium Head Blight Forum*, Milwaukee, WI; December 8-10. University of Kentucky, Lexington, KY. p. 12.

Status: Abstract Published and Poster Presented

Acknowledgement of Federal Support: YES (Abstract and Poster)

### **Journal publications.**

Paul, P., Salgado, J.D., Bergstrom, G., Bradley, C.A., Byamukama, E., Byrne, A.M., Cummings, J., **Chilvers, M.I.**, Dill-Macky, R., Friskop, A., Kleczewski, N., Madden, L.V., Nagelkirk, M., Stevens, J., Smith, M., Wegulo, S.N., Wise, K., Yabwalo, D. 2019. Integrated effects of genetic resistance and prothioconazole + tebuconazole application timing on Fusarium head blight in wheat. *Plant Disease* 103:223-237  
<https://doi.org/10.1094/PDIS-04-18-0565-RE>.

Status: Published

Acknowledgement of Federal Support: YES

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

### **Other publications, conference papers and presentations.**

#### Conference Abstracts:

Paul, P.A., S.N. Ng, G. Bergstrom, K. Bissonnette, K. Bowen, C. Bradley, E. Byamukama, Chilvers, A. Collins, C. Cowger, H. Darby, E. DeWolf, R. Dill-Mackey, P.D. Esker, A. Friskop, N. Kleczewski, A. Koehler, L. Madden, J. Marshall, H. Mehl, W. Moraes, M.

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Nagelkirk, N. Rawat, D. Smith, D. Telenko, S. Wegulo, and H. Young-Kelly. 2019. "Fusarium head blight management coordinated project: Integrated management trials 2018-2019." In S. Canty, A. Hoffstetter, H. Campbell, and R. Dill-Macky (Eds.), *Proceedings of the 2019 National Fusarium Head Blight Forum* (p. 20-24), Milwaukee, WI; December 8-10. University of Kentucky, Lexington, KY.

Status: Report Published and Poster Presented

Acknowledgement of Federal Support: Yes

Paul, P.A., S.N. Ng, G. Bergstrom, K. Bissonnette, K. Bowen, C. Bradley, E. Byamukama, Chilvers, A. Collins, C. Cowger, H. Darby, E. DeWolf, R. Dill-Mackey, P.D. Esker, A. Friskop, N. Kleczewski, A. Koehler, L. Madden, J. Marshall, H. Mehl, W. Moraes, M. Nagelkirk, N. Rawat, D. Smith, D. Telenko, S. Wegulo, and H. Young-Kelly. 2019. "Fusarium head blight management coordinated project: Uniform fungicide trials 2018-2019." In S. Canty, A. Hoffstetter, H. Campbell, and R. Dill-Macky (Eds.), *Proceedings of the 2019 National Fusarium Head Blight Forum* (p. 25-29), Milwaukee, WI; December 8-10. University of Kentucky, Lexington, KY.

Status: Report Published and Poster Presented

Acknowledgement of Federal Support: Yes

Presentations:

1. Corn, dry bean, wheat and soybean discussion, with focus on irrigation management of tar spot. Jim Shepard, Jeff Thorlund, Andy Thorlund, Scott Hipolite. 5774 West Fenwick, Greenville. Mar 11, 2020. 5 participants
2. Barley pathology and disease control. Great Lakes Hop and Barley Conference. Ypsilanti, MI. Feb 6, 2020. 40 participants
3. Disease susceptibility in extreme weather. MABA conference. Lansing, MI. Jan 14, 2020. 100 participants
4. Field crops disease update. MSUE IPM. Dundee, MI. Jan 3, 2020. 40 participants
5. Field crops diseases update. 2019 Integrated crop and pest management update. East Lansing, MI. Dec 18, 2019. 300 participants
6. Wheat field day. East Lansing MI. Jun 12, 2019 200 participants