

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

Cover Page

Principle Investigator (PI):	Gary Bergstrom
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Fiscal Year:	2019
USDA-ARS Agreement ID:	59-0206-8-195
USDA-ARS Agreement Title:	FHB Management Research in New York
FY19 USDA-ARS Award Amount:	\$ 11,853
Recipient Organization:	Cornell University 341 Pine Tree Road Ithaca NY 14850
DUNS Number:	872612445
EIN:	15-0532082
Recipient Identifying Number or Account Number:	1538165
Project/Grant Reporting Period:	5/3/19 - 5/2/20
Reporting Period End Date:	5/2/2020

USWBSI Individual Project(s)

USWBSI Research Category*	Project Title	ARS Award Amount
MGMT	Integrated Management of FHB and DON in Winter Wheat in New York	\$ 11,853
FY19 Total ARS Award Amount		\$ 11,853

Gary Carlton
Bergstrom

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Carlton Bergstrom
Date: 2020.07.27 22:01:08
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Gary C. Bergstrom
Principal Investigator

7/27/20
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: *Integrated Management of FHB and DON in Winter Wheat in New York*

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

To provide more robust recommendations for management of Fusarium head blight. Emphasis was placed on timings of fungicide treatments involving Miravis Ace.

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?

Replicated field experiments were conducted to investigate the individual and combined effects of variety resistance and fungicide application on FHB and DON accumulation in spring barley. Due to the excessively wet fall of 2018, we were unable to plant winter wheat. Therefore, we substituted experiments on spring malting barley in 2019.

b) What were the significant results?

Unfortunately, due to a very dry flowering and grain filling period, there was no significant development of foliar diseases, FHB, or DON contamination in either variety, AAC Synergy or KWS Tinka. Chemical or biological fungicide treatments and their timings had no significant effect on yield, test weight, or diseases parameters.

c) List key outcomes or other achievements.

It is important to document effects, or in this the lack of effects, of fungicide inputs in the absence of significant diseases.

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.

All objectives were accomplished in spite of COVID-19. We were unable to hire undergraduate workers in 2020, so there was a heavier workload on technical staff. That continues into FY20.

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

Though not funded on the grant, M.S. student Andrea Lugo-Torres helped to achieve project objectives. She landed a scientific position with Ascibe LLC and begins working there in September 2020.

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

Through field days, winter grower meetings, email listserves, presentations at the FHB Forum, and publication in *Plant Disease Management Reports*.

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Training of Next Generation Scientists

Instructions: Please answer the following questions as it pertains to the FY19 award period (5/3/19 - 5/2/20). 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?**

Yes

If yes, how many? 1

- 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 (5/3/19 - 5/2/20)** 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* (p. 12), Milwaukee, WI; December 8-10. University of Kentucky, Lexington, KY.

Status: Abstract Published and Poster Presented

Acknowledgement of Federal Support: YES (Abstract and Poster)

Journal publications.

Cowger, C., J. Smith, D. Boos, C.A. Bradley, J.K. Ransom, and G.C. Bergstrom. 2020. Managing a destructive, episodic crop disease: A national survey of wheat and barley growers’ experience with Fusarium head blight. *Plant Dis.* 104:634-648.

<https://apsjournals.apsnet.org/doi/10.1094/PDIS-10-18-1803-SR>

Status: Published

Acknowledgement of Federal Support: Yes

Fulcher, M.R., J.B. Winans, M. Quan, and G.C. Bergstrom. 2020. The incidence of *Fusarium graminearum* in wild grasses is associated with rainfall and cumulative host density in New York. *Plant Dis.* in press <https://doi.org/10.1094/PDIS-02-20-0286-RE>

Status: In press

Acknowledgement of Federal Support: Yes

Fulcher, M.R., E.D. Oladipo, J.B. Winans, M. Quan, and G.C. Bergstrom. 2020. Structure and diversity of *Fusarium* communities inhabiting non-cultivated grass inflorescences in New York State. *Can. J. Plant Pathol.* accepted DOI:10.1080/07060661.2020.1788166

Status: In press

Acknowledgement of Federal Support: Yes

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Starr, J.K., K.L. Myers, A. Lugo-Torres, G.C. Bergstrom, and P.J. Stachowski. 2020. Evaluation of integrated methods for management of Fusarium head blight of spring malting barley in New York, 2019. *Plant Disease Management Reports* 14: CF050.

Status: Published

Acknowledgement of Federal Support: Yes

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

Nothing to report.

Other publications, conference papers and presentations.

Fulcher, M.R., J.B. Winans, M. Quan, J.P. Garcia, K.C.M. Damann, and G. C. Bergstrom. 2019. "Potential of wild grass hosts to serve as reservoirs of pathogen genetic diversity and sources of inoculum." In S. Canty, A. Hoffstetter, H. Campbell, and R. Dill-Macky (Eds.), *Proceedings of the 2019 National Fusarium Head Blight Forum* (p. 67-70), Milwaukee, WI; December 8-10. University of Kentucky, Lexington, KY.

Status: Report Published

Acknowledgement of Federal Support: Yes

Lugo-Torres, A. and G.C. Bergstrom. 2019. "Fusarium flora and mycotoxin profiles of commercial malting barley grain lots in New York." In S. Canty, A. Hoffstetter, H. Campbell, and R. Dill-Macky (Eds.), *Proceedings of the 2019 National Fusarium Head Blight Forum* (p. 74), Milwaukee, WI; December 8-10. University of Kentucky, Lexington, KY.

Status: Report Published

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: 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*

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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

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Extension presentations by Gary C. Bergstrom in 2019-20 that included updates on Fusarium head blight research:

Finger Lakes Soybean and Small Grains Congress, Waterloo, NY. (2/6/20)

Status: Presented

Acknowledgement of Federal Support: Acknowledged in slides.

Western New York Soybean and Small Grains Congress, Batavia, NY. (2/5/20)

Status: Presented

Acknowledgement of Federal Support: Acknowledged in slides.

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Southern Tier Crop Congress, Belfast, NY. (1/22/20)

Status: Presented

Acknowledgement of Federal Support: Acknowledged in slides.

North Country Crop Congress, Canton, NY. (1/21/20)

Status: Presented

Acknowledgement of Federal Support: Acknowledged in slides.

Empire State Barley and Malt Summit. Syracuse, NY. (12/16-17/19)

Status: Presented

Acknowledgement of Federal Support: Acknowledged in slides.

Field Crop Dealer Meeting, Syracuse, NY. (12/5/19)

Status: Presented

Acknowledgement of Federal Support: Acknowledged in slides.

Cornell Cooperative Extensive Agriculture In-Service. Ithaca, NY (11/6/19)

Status: Presented

Acknowledgement of Federal Support: Acknowledged in slides.

Musgrave Research Farm Field Day, Aurora, NY. (7/11/19)

Status: Presented

Acknowledgement of Federal Support: Not applicable for this type of presentation.

Cornell Seed Growers Field Day. Ithaca, NY (7/2/19)

Status: Presented

Acknowledgement of Federal Support: Not applicable for this type of presentation.

Small Grains Management Field Day, Seneca Falls, NY (6/7/19)

Status: Presented

Acknowledgement of Federal Support: Not applicable for this type of presentation.

MAC Regional Dairy and Beef Extension Training Program. Wilkes Barre, PA. (5/30/19)

Status: Presented

Acknowledgement of Federal Support: Not applicable for this type of presentation.