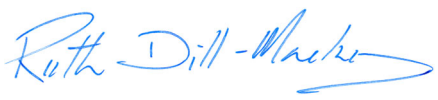
USDA-ARS/
U.S. Wheat and Barley Scab Initiative
FY19 Final Performance Progress Report
Due date: July 29, 2021

Cover Page

Principle Investigator (PI):	Ruth Dill-Macky
Institution:	University of Minnesota
E-mail:	ruthdm@umn.edu
Phone:	612-625-2227
Fiscal Year:	2019
USDA-ARS Agreement ID:	59-0206-9-117
USDA-ARS Agreement Title:	Management of Fusarium Head Blight in Small Grains.
FY19 USDA-ARS Award Amount:	$ 48,996
Recipient Organization:	Regents of the University of Minnesota Suite 450 Sponsored FIN RPT-P100100001 Minneapolis, MN 55455-2003
DUNS Number:	555917996
EIN:	41 -6007513
Recipient Identifying Number or Account Number:	CON000000079712
Project/Grant Reporting Period:	5/6/19 - 5/5/21
Reporting Period End Date:	5/5/2021

USWBSI Individual Project(s)

USWBSI Research Category*	Project Title	ARS Award Amount
MGMT	Minnesota Component of the FHB Integrated Management Coordinated Project	$ 29,148
GDER	A Field Nursery for Testing Transgenic Spring Wheat and Barley from the USWBSI	$ 19,848
	FY19 Total ARS Award Amount	**$ 48,996**



7/29/2021

Principal Investigator 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: *Minnesota Component of the FHB Integrated Management Coordinated Project*

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

Demethylation inhibitor (DMI) fungicides such as prothioconazole, metconazole, and tebuconazole have proven to be the most effective for Fusarium head blight (FHB) and deoxynivalenol (DON) management. When applied at or up to 6 days after anthesis to moderately resistant cultivars, these fungicides provide more than 70% reduction of both FHB index and DON, relative to an untreated, susceptible check. Preliminary results from trials conducted over the past few years showed that Miravis Ace (adepidyn; pydiflumetofen), a new succinate dehydrogenase inhibitor fungicide, has comparable efficacy against FHB and DON to the DMI fungicides Prosaro and Caramba when applied at anthesis (Feekes 10.5.1) or at 50% head emergence (Feekes 10.3). This project represented the Minnesota participation in two experiments proposed in the overall MGMT-CP, an integrated management trial (IM) and a uniform fungicide trial (UFT). In combination these trials have contributed to the overall effort to test Miravis Ace across grain market classes and growing conditions.

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?

We participated annually in the two nationally coordinated experiments in the MGMT-CP, the integrated management (IM) and a uniform fungicide (UF) trials in 2019 and 2020. In combination the data from these trials will contribute to the overall effort to test Miravis Ace across grain market classes and growing conditions. Experiments were established at two locations (St Paul and Crookston) for hard red spring wheat and barley in 2019 and for hard red spring wheat in 2020. The experiments were completed following the experimental design as established by the coordinating group.

b) What were the significant results?

In 2019 we generated significant levels of FHB and obtained data from the two locations in wheat and one location (Crookston) in barley where the experiments were established. The barley IM trial in St Paul was lost to lodging during a thunderstorm. The toxin analyses for the three 2019 trials that were harvested were completed in July 2020. The data files were compiled for submission to the project coordinator. In 2020 we conducted four trials (IM & UF trials at St Paul and Crookston) for hard red spring wheat. The toxin data for these trials was obtained in March 2021 and the data has been compiled ready for submission to the project coordinator.

c) List key outcomes or other achievements.

Results of these experiments will be used to advance the development of best management practices for FHB and DON.

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.

All field trials planned for 2019 and 2020, with the exception of the 2019 IM barley trial that was lost to lodging, were completed as planned although the post-harvest activities, including the DON testing were delayed following the closure of campus in response to the pandemic. Activities taking place inside the buildings were limited by staffing, we had summer interns to help with field work in 2019 but we had no help in 2020 and I was training a new field technician who started the day the campus closed. All samples for DON analyses in 2020 were submitted later than normal and the data were returned from the UMN mycotoxin testing lab in some months later than would have happened in a normal year. The data analyzes for both seasons were therefore delayed until after the subsequent years fieldwork was completed.

In 2021 we were able to hire a regular number of summer interns to help with field work so we do expect our schedule of activities to return normal schedule by the end of 2021, though it may take us some months to catch up on the backlog.

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

Undergraduate researchers utilized this project to gain experience in field-based research techniques.

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

The data collected from these trials, along with trials conducted by other colleagues as part of the integrated management coordinated project funded by the USWBSI, will ultimately be used in a meta-analysis that will be published in peer-reviewed scientific journals. The outcome of this large collaborative research effort will ultimately provide information of the efficacy of fungicide treatments for FHB that would not be obtainable by any individual scientist.

Project 2: *A Field Nursery for Testing Transgenic Spring Wheat and Barley from the USWBSI*

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

   This project had the objective of establishing an annual nursery to provide a central field-testing site for transgenic spring wheat and barley lines developed by researchers in the USWBSI.

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?**

   The 2019 field screening nursery consisted of 67 wheat and 8 barley entries evaluated in adjacent experiments at UMore Park, Rosemount MN. Trial entries and untransformed parental controls* were submitted by the University of Minnesota, Rutgers University, University of North Texas and the USDA-ARS. The trial was planted on May 17, 2019. All plots were inoculated to coincide with anthesis for wheat and head emergence for barley. A second inoculation was applied three days after the initial inoculation (d.a.i.) for each plot with the last inoculations conducted on July 15. The inoculum was a composite of 26 *F. graminearum* isolates, applied at a concentration of 100,000 macroconidia.ml^{-1} with Tween 20 (polysorbate) added at 2.5 ml.L^{-1} as a wetting agent. Mist-irrigation was applied from the first inoculation on June 29 through July 22 to facilitate FHB development. FHB incidence and severity were assessed visually. Approximately forty heads where harvested from each plot, threshed and the seed cleaned by hand. The wheat grain was used to determine the percentage of visually scabby kernels (VSK) and then all samples (wheat and barley) were ground and submitted for deoxynivalenol (DON) analysis. The data collected were provided to the scientists who submitted trial entries.

   In 2020 and 2021 no nurseries were conducted as no entries were received. Monitoring for volunteers, as required to be in compliance with 2019 APHIS permits was conducted as necessary throughout the 2020 field season and has commenced for the 2021 field season.

   b) **What were the significant results?**

   In 2019 the mean FHB severities for the wheat untransformed parental and/or checks Alsen, Bobwhite, CB037, Linkert, RB07, Rollag, and Sumai 3 were 41%, 61%, 52%, 35%, 39%, 37%, and 34%, respectively. The mean FHB severity for the susceptible wheat check Wheaton was 53%. The mean FHB severity for the untransformed parent barley check Rasmusson was 43% while the barley checks Quest and Stander had a mean FHB

severities of 23% and 62%, respectively.

The FHB severity data indicated that resistance was improved in some transformed lines compared to the untransformed checks. The DON data generally aligned with the observed levels of disease. Specific results were delivered to the cooperators and presented in the poster at the USWBSI forum in December 2019.

c) List key outcomes or other achievements.

In 2019 we conducted a successful nursery. The PI's submitting entries had their data ahead of the USWBSI forum and we presented the field data in a poster at that meeting.

In 2020 we met all APHIS permit requirements.

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.

No. All work in this project was completed as planned.

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

None. Given the nature of the project, only personnel with considerable experience in running transgenic nurseries and with APHIS and IBC authorization are allowed on the trial site.

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

The USWBSI-funded PIs with wheat and barley entries in the nursery have been provided their data and copied on all communications with APHIS regarding post-harvest site monitoring as necessary to meet permit obligations.

Training of Next Generation Scientists

Instructions: Please answer the following questions as it pertains to the **FY19 award period (5/6/19 - 5/5/21)**. 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
   If yes, how many? n/a

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
   If yes, how many? n/a

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
   If yes, how many? n/a

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
   If yes, how many? n/a

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 (5/6/19 - 5/5/21)**. 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
Not applicable to this project.	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.

FY19 Final Performance Progress Report
PI: Dill-Macky, Ruth
USDA-ARS Agreement #: 59-0206-9-117
Reporting Period: 5/6/19 - 5/5/21

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 (5/6/19 - 5/5/21**) 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:

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

Journal publications.

McKee, G., Cowger, C., Dill-Macky, R., Friskop, A., Gautam, P., Ranson, J., and Wilson, W. (2019). Disease management and estimated effects on DON (deoxynivalenol) contamination in Fusarium infested barley. *Agriculture*, 9:155.
Status: Published
Acknowledgement of Federal Support: Yes

Paul, P.A., Salgado, J.D., Bergstrom, G.C., Bradley, C.A., Byamukama, E., Byrne, A.M., Chapara, V., Cummings, J.A., Chilvers, M.I., Dill-Macky, R., Friskop, A.J., Kleczewski, N.M., Madden, L.V., Nagelkirk, M., Stevens, J., Smith, M.J., Wegulo, S.N., Wise, K.A., and Yabwalo, D.N. (2019). Integrated effects of genetic resistance and prothioconazole + tebuconazole application timing on Fusarium head blight in wheat. *Plant Disease*, 103:223-237.
Status: Published
Acknowledgement of Federal Support: Yes

McLaughlin, J.E., Darwish, N.I., Garcia-Sanchez, J., Tyagi, N., Trick, H.N., McCormick, S., Dill-Macky, R., and Tumer, N.E. (2020). A lipid transfer protein has antifungal and antioxidant activity and suppresses Fusarium head blight disease and DON accumulation in transgenic wheat. *Phytopathology* (First Look 25 Aug 2020)
Status: Published
Acknowledgement of Federal Support: Yes

Kumar, J., Rai, K.M., Pirseyedi, S., Elias, E.M., Xu, S., Dill□Macky, R., and Kianian, S.F. (2020). Epigenetic regulation of gene expression improves Fusarium head blight resistance in durum wheat. *Scientific Reports,* 10: 17610.
Status: Published
Acknowledgement of Federal Support: Yes

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

Nothing to Report

Other publications, conference papers and presentations.

De Wolf, E., Shah, D., Paul, P., Madden, L., Crawford, S., Hane, D., Canty, S., Dill-Macky, R., Van Sanford, D., Imhoff, K., and Miller, D. (2019). Impact of prediction tools for Fusarium head blight in the US, 2009-2019. In: *Proceedings of the 2019 National Fusarium Head Blight Forum*, Milwaukee, Wisconsin, December 8-10, 2019, p. 12.
Status: Published
Acknowledgement of Federal Support: Yes

Paul, P.A., Ng, S.J., Bergstrom, G., Bissonnette, K., Bowen, K., Bradley, C., Byamukama, E., Chilvers, M., Collins, A., Cowger, C., Darby, H., De Wolf, E., Dill-Macky, R., Esker, P., Friskop, A., Kleczewski, N., Koehler, A., Madden, L., Marshall, J., Mehl, H., Moraes, W., Nagelkirk, M., Rawat, N., Smith, D., Telenko, D., Wegulo, S., and Young-Kelly, H. (2019). Fusarium head blight management coordinated project: Integrated management trials 2018-2019. In: *Proceedings of the 2019 National Fusarium Head Blight Forum*, Milwaukee, Wisconsin, December 8-10, 2019, pp. 20-24.
Status: Published
Acknowledgement of Federal Support: Yes

Paul, P.A., Ng, S.J., Bergstrom, G., Bissonnette, K., Bowen, K., Bradley, C., Byamukama, E., Chilvers, M., Collins, A., Cowger, C., Darby, H., De Wolf, E., Dill-Macky, R., Esker, P., Friskop, A., Kleczewski, N., Koehler, A., Madden, L., Marshall, J., Mehl, H., Moraes, W., Nagelkirk, M., Rawat, N., Smith, D., Telenko, D., Wegulo, S., and Young-Kelly, H. (2019). Fusarium head blight management coordinated project: Uniform fungicide trials 2018-2019. In: *Proceedings of the 2019 National Fusarium Head Blight Forum*, Milwaukee, Wisconsin, December 8-10, 2019, pp. 25-29.
Status: Published
Acknowledgement of Federal Support: Yes

Dill-Macky, R., Curland, R.D., Zargaran, B., Muehlbauer, G.J., Bethke, G., Funnell-Harris, D., Shah, J., McLaughlin, J., and Tumer, N. (2019). Testing transgenic spring wheat and barley lines for reaction to Fusarium head blight: 2019 field nursery report. In: *Proceedings of the 2019 National Fusarium Head Blight Forum*, Milwaukee, Wisconsin, December 8-10, 2019, pp. 46-47.
Status: Published
Acknowledgement of Federal Support: Yes

Funnell-Harris, D., Duray, Z., Sattler, S., Wegulo, S., Dill-Macky, R., and Tatineni, S. (2019). Response of wheat constitutively expressing monolignol biosynthesis genes to Fusarium head blight. In: *Proceedings of the 2019 National Fusarium Head Blight Forum*, Milwaukee, Wisconsin, December 8-10, 2019, pp. 48-49.
Status: Published
Acknowledgement of Federal Support: Yes

Huang, Y., Yin, L., Sallam, A., Heinen, S., Beaubien, K., Dill-Macky, R., Dong, Y., Steffenson, B., Smith, K.P., and Muehlbauer, G.J. (2019). Genetic analysis of Fusarium head blight severity, malting quality and agronomic traits in the centromeric region of chromosome 6H in barley. In: *Proceedings of the 2019 National Fusarium Head Blight Forum*, Milwaukee, Wisconsin, December 8-10, 2019, p. 51.
Status: Published
Acknowledgement of Federal Support: Yes

McLaughlin, J.E., Tyagi, N., Trick, H.N., McCormick, S., Dill-Macky, R., and Tumer, N.E. (2019). Non-specific lipid transfer proteins (nsLTPs) have antifungal and anti-ROS properties that enhance resistance of wheat to *Fusarium graminearum* infection and deoxynivalenol exposure. In: *Proceedings of the 2019 National Fusarium Head Blight Forum*, Milwaukee, Wisconsin, December 8-10, 2019, p. 54.
Status: Published
Acknowledgement of Federal Support: Yes

Baldwin, T., Baldwin, S.A., Kress, E., Dill-Macky, R., Sorrells, M.E., Gross, P., Brueggeman, R., Griffey, C., Fitzgerald, J., Marshall, J., and Bregitzer, P. (2019). Fusarium head blight biomass measurements in barley from 2018 U.S. nurseries. In: *Proceedings of the 2019 National Fusarium Head Blight Forum*, Milwaukee, Wisconsin, USA, December 8-10, 2019, p. 85.
Status: Published
Acknowledgement of Federal Support: Yes

Kumar, J., Rai, K.M., Pirseyedi, S.M., Xu, S., Elias, E.M., Dill-Macky, R., and Kianian, S. (2019). Epigenetic modifications: a novel source of FHB resistance in durum wheat. In: *Proceedings of the 2019 National Fusarium Head Blight Forum*, Milwaukee, Wisconsin,

December 8-10, 2019, pp. 98-99.
Status: Published
Acknowledgement of Federal Support: Yes

Salgado, J.D., Bergstrom, G.C., Bradley, C.A., Bowen, K.L., Byamukama, E., Byrne, A., Collins, A.A., Cowger, C., Cummings, J., Chapara, V., Chilvers, M., Dill-Macky, R., Darby, H.M., Friskop, A.J., Kleczewski, N.M., Madden, L.V., Marshall, J.M., Mehl, H.L., Nagelkirk, M., Stevens, J., Smith, D.L., Smith, M.J., Wegulo, S.N., Wise, K.A., Yabwalo, D., Kelly, H.M., and Paul, P.A. (2019). Effects of two-treatment fungicide programs on grain yield and quality of Fusarium head blight-affected wheat. In: Abstracts of Presentations, 2019 APS Annual Meeting, Cleveland, OH, August 3-7, 2019, *Phytopathology,* 109: S2.65.
Status: Published
Acknowledgement of Federal Support: Yes

Abdullah, S., Mndowla, E., Baldwin, S.A., Kress, E., Dill-Macky, R., Sorrells, M.E., Gross, P., Brueggeman, R., Griffey, C., Fitzgerald, J., Marshall, J., Klos, K., and Baldwin, T. (2020). Fusarium head blight biomass in spring barley comparing 2018 to 2019 in U.S. nurseries. In: *Proceedings of the 2020 National Fusarium Head Blight Forum*. Online: December 7-11, 2020, p. 3.
Status: Published
Acknowledgement of Federal Support: Yes

Baldwin, T., Gross, P., Horsley, R., Smith, K., Dill-Macky, R., Tucker, J., Badea, A., Timmerman, M., Case, A., and Brueggeman, R. (2020). 2020 Hindsight on the North American barley evaluation nursery (NABSEN). In: *Proceedings of the 2020 National Fusarium Head Blight Forum*. Online: December 7-11, 2020, pp. 6-7.
Status: Published
Acknowledgement of Federal Support: Yes

Luis, J.M., Ng, S.J., Bergstrom, G., Bissonnette, K., Bowen, K., Bradley, C., Byamukama, E., Chilvers, M., Collins, A., Cowger, C., Darby, H., DeWolf, E., Dill-Macky, R., Esker, P., Friskop, A., Kleczewski, N., Koehler, A., Madden, L., Marshall, J., Mehl, H., Moraes, W., Nagelkirk, M., Rawat, N., Smith, D., Telenko, D., Wegulo, S., Young-Kelly, H., and Paul, P.A. (2020). Fusarium head blight management coordinated project: Integrated management trials 2018-2020. In: *Proceedings of the 2020 National Fusarium Head Blight Forum*. Online: December 7-11, 2020, pp. 38-43.
Status: Published
Acknowledgement of Federal Support: Yes

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

Nagelkirk, M., Rawat, N., Smith, D., Telenko, D., Wegulo, S., Young-Kelly, H., and Paul, P.A. (2020). Fusarium head blight management coordinated project: Uniform fungicide trials 2018-2020. In: *Proceedings of the 2020 National Fusarium Head Blight Forum*. Online: December 7-11, 2020, pp. 44-48.
Status: Published
Acknowledgement of Federal Support: Yes

Funnell-Harris, D., Duray, Z., Dill-Macky, R., O'Neill, P., Sattler, S., Wegulo, S., and Tatineni, S. (2020). Discovering gene expression changes linked to phenylpropanoid-based FHB resistance. In: *Proceedings of the 2020 National Fusarium Head Blight Forum*. Online: December 7-11, 2020, p. 68.
Status: Published
Acknowledgement of Federal Support: Yes

Huang, Y., Yin, L., Sallam, A., Heinen, S., Beaubien, K., Dill-Macky, R., Dong, Y., Steffenson, B., Smith, K.P., and Muehlbauer, G.J. (2020). Genetic mapping of Fusarium head blight severity, malting quality, and agronomic traits in the pericentromeric region of chromosome 6H in barley. In: *Proceedings of the 2020 National Fusarium Head Blight Forum*. Online: December 7-11, 2020, p.69.
Status: Published
Acknowledgement of Federal Support: Yes