

USDA-ARS
U.S. Wheat and Barley Scab Initiative
FY20 Annual Performance Progress Report
Due date: August 31, 2021

Cover Page

Principle Investigator (PI):	Santiago Mideros
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Fiscal Year:	2020
USDA-ARS Agreement ID:	59-0206-0-144
USDA-ARS Agreement Title:	Integrated Management of Wheat in Illinois
FY20 USDA-ARS Award Amount:	\$ 57,809
Recipient Organization:	The Board of Trustees of the University of Illinois Grants & Contracts Office 1901 S. First Street, Suite A Champaign, IL 61820
DUNS Number:	41544081
EIN:	37-6000511
Recipient Identifying Number or Account Number:	AG060
Project/Grant Reporting Period:	7/1/20 - 6/30/21
Reporting Period End Date:	6/30/2021

USWBSI Individual Project(s)

USWBSI Research Category*	Project Title	ARS Award Amount
MGMT	Assessing Cross Resistance and Baseline Sensitivity to SDHI Fungicides in <i>F. graminearum</i>	\$ 36,728
MGMT	Integrated Management of FHB in Illinois Wheat	\$ 21,081
FY20 Total ARS Award Amount		\$ 57,809



26 August 2021

Principal Investigator

Date

* MGMT – FHB Management
 FST – Food Safety & Toxicology
 R- Research
 S – Service (DON Testing Labs)
 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: *Assessing Cross Resistance and Baseline Sensitivity to SDHI Fungicides in F. graminearum*

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

Generate baseline sensitivities for adepidyn and select second-generation fungicide active ingredients in *F. graminearum* populations across wheat and barley production regions in the US.

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?

- A population of 498 isolates of *Fusarium graminearum* was collected from multiple sources. Some isolates were de-novo isolations from infected wheat or barley samples collected in Illinois or provided by collaborators. From these samples multiple isolates were collected. Other isolates were voucher specimens from collaborators. All the isolates were desiccated and frozen for long term storage.
- Poison plate assays were conducted for a subset the population. Preliminary LD50 for these isolates were calculated.
- As agreed with the USWBSI the project PI was transferred to Dr. Alyssa Koehler (University of Delaware). The desiccated isolates were shipped to Delaware and the LD50 data were sent by email.

b) What were the significant results?

Close to 500 isolates were obtained.

Preliminary LD50 data was generated for a possible baseline sensitivity of *F. graminearum* to adepidyn. Further data needs to be collected to confirm results and finalize the analysis.

c) List key outcomes or other achievements.

- A large population of *F. graminearum* strains was collected and prepared for long term storage. The population was transferred to the University of Delaware.
- Preliminary LD50 data was collected. The data was sent to the University of Delaware.
- Due to problems with personnel exacerbated by change of PI (due to the departure of Dr. Kleckzewski from the University of Illinois) and the covid-19 pandemic it was agreed with USWBSI to transfer the project entitled "*Cross Resistance and Baseline Sensitivity to SDHI Fungicides in F. graminearum*" to the University of Delaware.

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- 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.**

Covid mitigation measures added a layer of complexity for conducting laboratory work which impacted progress and communication for the personnel involved in this project.

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

An undergraduate student was trained on sterile technique, isolations, media preparation, conducting poison plate assays.

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

Results have not been disseminated for this project.

Project 2: Integrated Management of FHB in Illinois Wheat

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

Assess the utility of Miravis Ace[®] compared to Caramba[®], Prosaro[®], and Proline[®] and develop a better sense of the application window for this new fungicide.

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?

In October of 2020, a field trial was conducted in Urbana, Illinois. The trial was established with two winter wheat varieties and inoculated in April of 2021. Trials were sprayed with Miravis Ace at three development points (10.5.1, 10.3, 10.5.1), Prosaro, BAS8400F, and two controls. Harvest occurred in June of 2021.

b) What were the significant results?

Incidence and disease severity were evaluated once in Urbana. At harvest, percent moisture, test weight, and yield were recorded. FDK was obtained from harvested samples.

c) List key outcomes or other achievements.

Field trials successfully conducted in 2021.
Data was collected, aggregated, and will be sent to collaborators for analysis and publication.

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.

The impact of the covid-19 pandemic on this project is unclear.

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

Three undergraduate students were trained and participated on seed preparation, field preparation (e.g. staking), planting, fungicide application, ratings for disease, FDK ratings, and sample preparation for DON analysis.

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

Results from this project have not been disseminated to communities of interest yet.

Training of Next Generation Scientists

Instructions: Please answer the following questions as it pertains to the FY20 award period (7/1/20 - 6/30/21). 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 FY20 award period (7/1/20 - 6/30/21). 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
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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.

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Publications, Conference Papers, and Presentations

Instructions: Refer to the PR_Instructions for detailed more instructions for listing publications/presentations about your work that resulted from all of the projects included in the FY20 grant award. Only citations for publications published (submitted or accepted) or presentations presented during the **award period (7/1/20 - 6/30/21)** 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.

Nothing to report.

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

Nothing to report.

Other publications, conference papers and presentations.

Nothing to report.