

Hillary Fischer
Department of Entomology
319 Agriculture Building, University of Arkansas
Fayetteville, AR 72701
Office: 479-575-2451; E-mail: hdfische@uark.edu

EDUCATION

- 2016-Present Ph.D., Entomology (anticipated completion August 2020)
University of Arkansas
Dissertation: The role of reactive oxygen species and phytohormones in plant
defense against aphids
Advisor: Dr. Fiona Goggin
- 2016 B.S., Insect Science and Plant Biology
Minors in Chemistry and English
University of Nebraska-Lincoln
Undergraduate Thesis: Characterizing the effects of feeding by *Aphis glycines*
Matsumura on callose deposition in soybean resistance
Advisor: Dr. Tiffany Heng-Moss
GPA: 3.72

PROFESSIONAL EXPERIENCE

- 2013-2016 Undergraduate Research Assistant, University of Nebraska-Lincoln
Research assistant, plant-insect interactions lab (Dr. Tiffany Heng-Moss); assist with grad
student projects; conduct undergraduate research project
- 2012-2013 Course Developer, University of Nebraska-Lincoln
Developed online lab for Aquatic Insects course (Dr. Stephen Danielson); photographed
key characteristics to construct online dichotomous keys

MANUSCRIPTS IN REVIEW

- Marchi-Werle, L., Baldin, E.L.L., **Fischer, H. D.**, Heng-Moss T. M., and Hunt, T. E. Economic
injury levels for soybean aphid (*Aphis glycines* Matsumura) on the soybean aphid tolerant
KS4202 soybean (*Glycine max* (L.) Merrill). Journal of Economic Entomology.
- Marchi-Werle, L., **Fischer, H. D.**, Graef, G., Hunt, T. E., and Heng-Moss T. M. Characterization
and identification of methods for phenotyping soybean populations with tolerance to soybean
aphid: exploring alternatives for breeding tolerant plants. Journal of Economic Entomology.
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SCIENTIFIC PRESENTATIONS

- Jesus, F., Marchi-Werle, L, **Fischer, H.**, and Heng-Moss, T. 2016. Resistance of soybean genotypes to *Aphis glycines* (Hemiptera:Aphididae). International Conference of Entomology Meeting, Orlando, FL.
- Marchi-Werle, L., **Fischer, H.**, Hunt, T., Heng-Moss, T., and Graef, G. 2015. Integrating plant tolerance into breeding programs for soybean aphid (*Aphis glycines* Matsumura) management. Entomological Society of America Annual Meeting, Minneapolis, MN.

TEACHING EXPERIENCE

Undergraduate Teaching Assistant, University of Nebraska-Lincoln	
Plant Science (AGRO 130)	2012-2014
Insect Biology (ENTO 115)	2013-2016
Genetics (AGRO 315)	2015-2016
Insect Identification (ENTO 116)	2016

- 2015- 2016 Mentor, University of Nebraska - Lincoln
Mentor to eight freshman scholarship students from Rwanda; tutored in Chemistry, English, Soil Science and Plant Science; assisted with fiscal management and budgeting

LEADERSHIP

- Linnaean Game Organizer (2015) - Entomology Alumni Dinner, University of Nebraska - Lincoln
Insect Science Club Member (2012-2016), **President** (2015-2016), **Vice President** (2014-2015),
University of Nebraska – Lincoln
Isely-Baerg Entomology Club Member (2016-Present), **President** (2017- Present)
President (2016-Present) – Arkansas Entomological Society

OUTREACH EXPERIENCE

- 2017** McNair Middle School – Grasshopper Dissection Education, Fayetteville, AR
Homeschool Insect Collection Outreach, Fayetteville, AR
- 2016** *Wild Adventure*, Pioneer's Park, Lincoln, NE
Niobrara State Park, Nebraska BioBlitz
Woolsey Wetland Prairie, Arkansas BioBlitz
Girl Scouts Troop – Insect Education, Fayetteville, AR
- 2015** *ZooZeum Day*, Lincoln Children's Museum
Beneficial Insects Presentaion - Kloefkorn Elementary School, Lincoln, NE
CASNR Community Night – Entomology Exhibit
Women in Science Conference – Entomology Invited Representative
Wild Adventure, Pioneer's Park, Lincoln, NE
Science Night – Live arthropods booth, Kloefkorn Elementary School, Lincoln, NE
STEM Expo Exhibitor for Science Olympiad National Tournament, Lincoln, NE
Archie's Late Night Party, University of Nebraska State Museum at Morrill Hall
Butterfly Presentation - Pyrtle Elementary School, Lincoln, NE
Twilight on the Tallgrass, Spring Creek Prairie Audubon Center

- Bug Fest*, Department of Entomology, University of Nebraska-Lincoln
Happy HallowGreen, Lincoln Children's Museum
Howling Homestead – Live arthropod demonstration, Beatrice, NE
- 2014** *Sunday with a Scientist*, University of Nebraska State Museum at Morrill Hall
 “Insects and Other Arthropods”, Dr. Tiffany-Heng-Moss
 Women in Science Conference - Agronomy and Entomology Invited Representative
 Bruner Club Pollinator Exhibit at AppleJack Festival
Bug Fest, Department of Entomology, University of Nebraska-Lincoln
Happy HallowGreen, Lincoln Children's Museum
- 2013** *Bug Fest*, Department of Entomology, University of Nebraska-Lincoln
Fright at the Museum - Morrill Hall, University of Nebraska - Lincoln

EXTRACURRICULAR AND VOLUNTEER EXPERIENCE

- Insect Festival – Actor in Insect Musical (2016), University of Arkansas “Insect zoo” caretaker
 Linnaean Game team member, University of Arkansas (2016-present)
 (2014 – 2016), University of Nebraska-Lincoln
 Aide in Summer Science Soybean Institute (2014, 2015), University of Nebraska-Lincoln
 Study Abroad: Costa Rica (AGRI 310, Summer 2015), University of Nebraska-Lincoln – Two
 weeks exploring the biodiversity of the rain forest and learning about local agriculture

HONORS AND AWARDS

- National Science Foundation Graduate Research Fellowship – Honorable Mention (2017)
 Arthur von Bergen Memorial Award (2016) – Awarded based on high academic achievement
 and involvement in the College of Agricultural Sciences and Natural Resources,
 University of Nebraska – Lincoln. Nominated by Dr. Tiffany Heng-Moss.
 Milton E. Mohr Research Award (2015) – Requiring departmental nomination; selection based
 on academic performance and potential for accomplishment in respective field.
 Nominated by Entomology Department, University of Nebraska – Lincoln
 Dean’s List (2012–2016), University of Nebraska-Lincoln
 Dean's List (2011–2012), Northwest Missouri State University
 Mark Metcalf Writing Achievement Award (2011)

SCHOLARSHIPS

- 2015** Dr. Franklin Keim Memorial Scholarship
 Holling Memorial Scholarship
 Cabela's UNL Education Fund
- 2014** E & B Ramsey Scholarship
 E. & V. Hixon Scholarship
 Cabela's UNL Education Fund
 Robinson Family Scholarship
- 2013** Lampert Family Scholarship
 D. Monson Agriculture Scholarship

Allegra Wilkens Scholarship
2012 Robinson Family Scholarship
H.R. & J.K. Evers Scholarship
Pioneer Excellence Scholarship

MEMBERSHIPS

Entomological Society of America

2015 – Present

RESEARCH PROJECTS

Graduate Research

Aphid resistance mechanism in *fatty acid desaturase 7 (fad7)* *Arabidopsis* mutant. (2016-present)
Performed choice and no-choice assays to determine antibiotic and antixenotic resistance of *fad7* compared with Col-0 wild-type.

Utilizing plant-imaging technology to measure luminescence in the plant. (2016-present)
Used reporter gene fusion specifically activated by reactive oxygen species (ROS) to identify location and magnitude of ROS accumulation in *Arabidopsis*.

Honeydew and phloem sugar analysis of maize for aphid and heat-stress tolerance. (2016- present)
Collect honeydew and phloem sugar to be analyzed using HPLC to see measure the stress response of the mutant and wild type maize.

Undergraduate Research

Characterizing the effects of feeding by *Aphis glycines* Matsumura on callose deposition in soybean resistance. Senior Thesis. (2015-2016)

Compared three genotypes of soybean in tolerant, resistant, and susceptible categories. Quantified callose by staining with aniline blue and measuring fluorescence with spectrophotometer.

Identifying methods for phenotyping soybean populations with tolerance to soybean aphid (*Aphis glycine* Matsumura) and developing new economic injury levels for soybean aphid-tolerant varieties. Research assistant for Dr. Lia Marchi-Werle's PhD project. (2013-2016)

Compared systemic and local gene expression response in tolerant, susceptible, and two high yielding soybeans to aphid infestation. Processed samples with RNA extraction and rt-qPCR. Also, ran enzyme kinetic assays to document the total peroxidase activity.

Over two field seasons, evaluated the relationship between cumulative aphid-days and yield loss to develop new economic injury levels for soybean aphids on an aphid-tolerant variety.

Arthropod biodiversity in perennial warm season grasses. Research assistant for Katie Keller's Masters project. (2013-2016).

Three field seasons. Assisted in characterizing the arthropod communities in perennial warm season grasses. Used sticky cards and pitfall traps to sample both ground and aerial arthropods in fields.

High School Research

Compared homemade rooting solution to commercial rooting solutions in inducing root growth on German ivy. (2010)

Finalist in Regional and State Junior Academy of Science competitions. Presented at National Junior Academy of Science meeting, Washington D.C.

Tested efficacy of 70% isopropanol versus distilled water for extracting indolebutyric acid from willow shoots to induce root growth on German ivy. (2011)

1st place winner in Regional and State Junior Academy of Science competitions. Presented at National Junior Academy of Science meeting, Vancouver, B.C.

SKILLS

Molecular Biology

Callose Quantification

DNA/RNA Extraction

Enzyme Kinetics Assay

Qualitative PCR

rt-qPCR

Gel Electrophoresis

Plant Physiology and Phenomics

Aphid Stylectomy

Bioassay of herbivore damage on *Arabidopsis*, soybean, and switchgrass

High-throughput Phenotyping of Plants (LemnaTec Scanalyzer HTS System)

Honeydew Collection

Phenotypic Aphid Tolerance Screening

Statistical Analysis Programs

JMP

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