

Andrew P. Michel, Ph.D.

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PROGRAM MISSION

My goal is to understand how insect pests adapt to rapidly changing selection pressures in agroecosystems such as host-shifting to important crops or resistance to management tactics. Specifically, my research uses molecular ecology and population genomic techniques to characterize the genetic basis for insect pest adaptation and how these adaptive traits spread across the landscape. Understanding and demonstrating how insects adapt, as well as communicating research-based insect management recommendations, delays the evolution of resistance or emergence of pests, and ensures a safer, sustainable and more productive food supply. My program has produced 96 publications, graduated 6 Ph.D. students and 1 Master's student, and generated over \$10 million as PI or co-PI. I have engaged with extension stakeholders using hundreds of co-authored newsletter articles, dozens of co-authored fact sheets, and over 150 presentations.

PROFESSIONAL EXPERIENCE

Associate Dean and Director of the CFAES Wooster Campus, The Ohio State University, *Jan. 2023-Present*

Professor, Dept. of Entomology, CFAES Wooster Campus, The Ohio State University, *Sep 2019-Present*

- Associate Chair, Entomology, *Oct 2019-Dec 2022*
- Associate Director, Center for Applied Plant Sciences, *Mar 2017-May 2023*
- Co-Director, Master of Plant Health Management Program, *Aug 2021-Dec 2022*
- Interim Associate Chair, Entomology, *Apr 2016-Oct 2019*
- Associate Professor, *Sep 2013-Aug 2019*
- Assistant Professor, *Sep 2007-Aug 2013*
- 70% Research: Insect molecular ecology and adaptation
- 30% Extension: Field crop insect management

Post-Doctoral Researcher, Department of Biological Sciences, University of Notre Dame, *Aug 2005-Aug 2007*

EDUCATION

Ph.D., Department of Biological Sciences, University of Notre Dame, *2001-2005*

B.Sc., Department of Entomology, Purdue University, *1997-2001*

- Minors: Biology & International Studies

HONORS AND AWARDS

- OSU Distinguished Multi-disciplinary Team Extension Award, CFAES Integrated Pest Management Team (J. Jasinski, Lead), 2021
- International IPM Team Award of Excellence, Soybean Aphid Team (K. Tilmon, Lead), 2018
- 3rd Place, OSU Post-Doctoral Mentor Award Competition, 2018
- OARDC Multidisciplinary Team Research Award, Soybean Research, 2016
- Early Career Innovation Award, Entomological Society of America, 2015
- OARDC Distinguished Junior Faculty Research Award, The Ohio State University, 2015
- Schmitt Graduate Research Fellow, University of Notre Dame, 2001
- Outstanding Sophomore Award, College of Agriculture, Purdue University, 1998

PEER REVIEWED PUBLICATIONS (106 total, 98 @ OSU)

(last 5 years listed, see Appendix 1 for complete list)

1. Farhan J, Smith JL, Sovic MG, Michel AP. 2023. Genetic mutations linked to field-evolved Cry1Fa-resistance in the European corn borer, *Ostrinia nubilalis*. *Scientific Reports*. 13:8081.
2. Edgington H, Pavinato VAC, Spacht D, Gantz JD, Convey P, Lee RE, Denlinger DL, Michel A. 2023. Genetic history, structure and gene flow among populations of *Belgica antarctica*, the only free-living insect in the western Antarctic Peninsula *Polar Science*. 36: 100945.
3. Hong, Z, Michel A, Long E. 2023. Optimizing a rapid LAMP assay for discrimination of *Drosophila suzukii* (Diptera: Drosophilidae) from common drosophilids captured in monitoring traps from the Midwest, USA. *Journal of Economic Entomology*. 116: 1391-1397.
4. Devlin J, Unfried L, Lecheta M, McCabe E, Gantz JD, Kawarasaki Y, Elnitsky M, Hotaling S, **Michel A**, Convey P, Hayward S, Teets N. 2022. Simulated winter warming negatively impacts survival of Antarctica's only endemic insect. *Functional Ecology*. 36:1949-1960.
5. Ribeiro AV, Aita RC, Pezzini DT, DiFonzo CD, Hunt TE, Knodel JJ, Krupke CH, Marchi-Werle L, **Michel AP**, Seiter NJ, Wright RJ, Hutchison WD and Koch RL. 2022. Optimization of sample unit size for sampling stink bugs (Hemiptera: Pentatomidae) in soybean. *Crop Protection*. **157**: 105986.
6. Bezerra do Nascimento AR, Pavinato VAC, Rodrigues JG, Silva-Brandão KL, Consoli FL, **Michel A**, Omoto C. 2022. There is more than chitin synthase in insect resistance to benzoylureas: Molecular markers associated with teflubenzuron resistance in *Spodoptera frugiperda*. *Journal of Pest Science*. 95:129-144.
7. Esquivel CJ, Cañas LA, Tilmon KJ and **Michel A**. 2021. Evaluating the role of insecticidal seed treatment and refuge for managing soybean aphid virulence. *Pest Management Science*. 77: 2924-2932.
8. Tilmon KJ, **Michel A**, and O'Neal ME. 2021. Aphid resistance is the future for soybean production, and has been since 2004: Efforts towards a wider use of host plant resistance in soybean. *Current Opinion in Insect Science*. 45: 53-58.
9. **Michel A**, Harris M. 2021. Why modern research justifies the re-emergences of host-plant resistance as a focus for pest management. *Current Opinion in Insect Science*. 45: iii-v.
10. Bansal R, Mian MAR, **Michel A**. 2021. Characterizing Resistance to Soybean Aphid: Antibiosis and Antixenosis Assessment. *Journal of Economic Entomology*. 114: 1329-1335.

11. Carlesso Aita R, et al. 2021. Presence–Absence Sampling Plans for Stink Bugs (Hemiptera: Pentatomidae) in the Midwest Region of the United States. *Journal of Economic Entomology*. 114:1362-1372.
12. Wenger JA, Cassone BJ, Legeai F, Johnston JS, Bansal R, Yates AD, Coates BS, Pavinato VAC, **Michel A**. 2020. Whole genome sequence of the soybean aphid, *Aphis glycines*. *Insect Biochemistry and Molecular Biology*. 123: 102917
13. Yates-Stewart AD, Pekarcik A, **Michel A**, Blakeslee JJ. 2020. Jasmonic acid-isoleucine (JA-Ile) is involved in the host-plant resistance mechanism against the soybean aphid (Hemiptera: Aphididae). *Journal of Economic Entomology*. 113:2972-2978.
14. Rajarapu SP, Bansal R, Mittapelly P, **Michel A**. 2020. Transcriptome analysis reveals functional diversity in salivary glands of plant virus vector, *Graminella nigrifrons*. *Genes*. 11:1289.
15. Esquivel CJ, Martinez EJ, Baxter R, Trabanino R, Ranger CM, **Michel A**, Cañas LA. 2020. Thiamethoxam differentially impacts survival of the generalist predators, *Orius insidiosus* and *Hippodamia convergens*, when exposed via the food chain. *Journal of Insect Science*. 20:13.
16. Cordeiro EMG, Pantoja-Gomez LM, de Paiva JB, Nascimento ARB, Omoto C, **Michel AP**, Correa AS. 2020. Hybridization and introgression between *Helicoverpa armigera* and *H. zea*: an adaptational bridge. 20:61. *BMC Evolutionary Biology*.
17. Yates-Stewart AD, Daron J, Wijeratne S, Slotkin RK, **Michel A**. 2020. Soybean aphids adapted to host-plant resistance by down regulating putative effectors and up regulating transposable elements. *Insect Biochemistry and Molecular Biology*. 121: 103363.
18. Coates et al. 2020. Genome scan detection of selective sweeps among biotypes of the soybean aphid, *Aphis glycines*, with differing virulence to resistance to *A. glycines* (*Rag*) traits in soybean, *Glycine max*. *Insect Biochemistry and Molecular Biology*. 124: 103364.
19. Murúa MG, Vera MA, **Michel A**, Casmuz AS, Faretto J, Gastaminza G. 2019. Performance of field-collected *Spodoptera frugiperda* (Lepidoptera: Noctuidae) strains exposed to different transgenic and refuge maize hybrids in Argentina. *J. Insect Sci*. 19:21.
20. Smith JL, DiFonzo CD, Baute TS, **Michel AP**, Krupke CK. 2019. Ecology and management of the western bean cutworm (Lepidoptera: Noctuidae) in corn and dry beans – Revision with focus on the Great Lakes region. *Journal of Integrated Pest Management*. 10:27.
21. Izascum Pérez-Valencia L, **Michel AP**, Moya-Raygoza G, Rodríguez A. 2019. Genetic variation and structure of *Diaphorina citri* (Hemiptera:Liviidae) in populations from México. *Annals of the Entomological Society of America*. 112: 379–387.
22. Mittapelly P, Bansal R, **Michel A**. 2019. Differential expression of cytochrome P450 CYP6 genes in the brown marmorated stink bug, *Halyomorpha halys* (Hemiptera: Pentatomidae). 2019. *Journal of Economic Entomology*. 112: 1403-1410.
23. Esquivel CJ, Ranger CM, Phelan L, Martinez EJ, Hendrix WH, Cañas LA, and **Michel AP**. 2019. Weekly survivorship curves of soybean aphid biotypes 1 and 4 on insecticidal seed-treated soybean. *Journal of Economic Entomology*. 112: 712–719.
24. Pérez-Alquicira J, **Michel A**., van der Knaap EE, Mercer K, Mitchell T, McHale L, Luna-Ruiz J, Texocotitla-Vázquez E, Vargas-Ponce O. 2019. Genetic structure of *Liriomyza trifolii* (Diptera: Agromyzidae) associated with host plants from southeastern Mexico. *Environmental Entomology*. 48: 253–262.

25. Angelella G, **Michel A**, and Kaplan I. 2019. Using host-associated differentiation to track source population and dispersal distance among insect vectors of plant pathogens. *Evolutionary Applications*. 12: 692-704.
26. Taitano N, Bernau V, Barbolla L, Leckie B, Mazourek M, Mercer K, McHale L, **Michel A**, Baumler D, Kantar M, van der Knaap E. 2019. Genome-wide genotyping of a novel Mexican chile pepper collection illuminates the history of landrace differentiation after *Capsicum annuum* L. domestication. *Evolutionary Applications*. 12:78-92.
27. Ng S, Dorrance AE, **Michel AP**, Lindsey L. 2018. Effect of Mid-Season Foliar Fungicide and Foliar Insecticide Applied Alone and In-Combination on Soybean Yield. *Crop and Soils Magazine*. July-August: 52-58.
28. Yates AD, **Michel AP**. 2018. Mechanisms of aphid adaptation to host plant resistance. *Current Opinion in Insect Science*. 26: 41-49.
29. Piermarini PM, Inocente EA, Acosta N, Hopkins CR, Denton JS, **Michel AP**. 2018. Inward rectifier potassium (Kir) channels in the soybean aphid *Aphis glycines*: Functional characterization, pharmacology, and toxicology. *Journal of Insect Physiology*. 110:57-65.
30. Hanson AA, Lorenz AJ, Hesler LS, Bhusal SJ, Bansal R, **Michel AP**, Jiang GL, Koch RL. 2018. Genome-Wide Association Mapping of Host-Plant Resistance to Soybean Aphid. *Plant Genome*. 11: 10.3835.
31. Murúa MG, Vera MA, Herrero MI, Fogliata SV, **Michel AP**. 2018. Defoliation of Soybean Expressing Cry1Ac Against Lepidopteran Pests. *Insects*. 9: E93
32. Bansal R, **Michel AP**. 2018. Expansion of cytochrome P450 and cathepsin genes in the generalist herbivore brown marmorated stink bug. *BMC: Genomics*. 19:60.
33. ESA Position Statement on Insect Resistance Management for Genetically Modified Crops. 2018. *Annals of the Entomological Society of America*. 111:3-5.
34. Pavinato VAC, **Michel AP**, de Campos JB, Omoto C, Zucchi M. 2018. Influence of historical land use and modern agricultural expansion on the spatial and ecological divergence of sugarcane borer, *Diatraea saccharalis* (Lepidoptera: Crambidae) in Brazil. *Heredity*. 120:25–37.

Chapters in Editor Reviewed Books:

1. Bansal, RB and **Michel AP**. 2015. Molecular Adaptations of Aphid Biotypes in Overcoming Host Plant Resistance. In *Short Views on Insect Genomics and Proteomics*. [ed] R. Chandrasekar, M Goldsmith, Springer Publishing. (invited book chapter)
2. Bansal R, Jun T-H, Mian MAR, **Michel AP**. 2012. Developing Host-Plant Resistance for Hemipteran Soybean Pests: Lessons from Soybean Aphid and Stink Bugs. In *Soybean-Pest Resistance*. Ed. Hany A. El-Shemy. INTECH publishing, Vienna, Austria. (invited book chapter).
3. **Michel AP**, Mittapalli O, Mian MAR. 2011. Evolution of Soybean Aphid Biotypes: Understanding and Managing Virulence to Host-Plant Resistance. In: *Soybean: Molecular Aspects of Breeding*. pp. 355-372. Ed. A. Sudaric. INTECH publishing, Vienna, Austria. (invited book chapter).

ACTIVE GRANTS/FUNDING

Total as PI > \$3 Million, as Co-PI >\$8 Million

My program has leveraged funding from multiple and diverse organizations, including internal OSU programs, federal (USDA and NSF), commodity (Ohio Soybean Council, North Central

Soybean Research Program, United Soybean Board), and industry (Monsanto/Bayer, Syngenta, DowAgroSciences). In 2022 and 2023, I was awarded 4 projects from the USDA as a PI or Co-PI totaling \$2.1 million dollars.

Current (past funded projects available upon request)

1. 09/2023-08/2025. Addressing IPM Challenges: 3D printing in practice. \$199,941. USDA-NIFA-AFRI-CPPM. PI: A. Leach. Co-PI: A. Michel and M. Rodriguez.
2. 01/2023-12/2025. Bottom-up trophic cascades: how a changing climate can shift plant-pest-natural enemy dynamics. USDA-NIFA-AFRI Foundational. \$552,890. PI: A. Michel. Co-PI: M. Lewis, R. Parshad. (*Note: Dr. Maggie Lewis, a postdoctoral fellow in my laboratory was primarily responsible for this proposal.)
3. 09/2022-08/2025. FORAGE: Fall armyworm Outreach and Research for Alfalfa Growers and Educators. USDA Alfalfa Seed and Alfalfa Forage Systems. PI: **A. Michel**. Co-PI: M. Sulc, K. Tilmon, R. Villaneuva and C. Teutsch. \$868,104.
4. 09/2022-08/2025. Remembering a Forgotten Pest: Bt Resistance and Monitoring in European Corn Borer. USDA-Biotech Risk Assessment Grant. PI: **A. Michel**. Co-PI: J. Smith, A. Schaafsma. \$499,928.
5. 09/01/2021 –08/31/2024. Ohio Extension Implementation Program 2021-23. USDA-NIFA CPPM EIP. \$797,622. PI: J. Jasinski. Co-PI: Bergefurd, B.; Ellsworth, D.; Gardiner, M.; McDermott, T.; **Michel, A.**; Paul, P.; Pierzynski, J.; Stone, A.; Tilmon, K.; Wilson, A.; Philip, B.
6. 10/2021-8/2024. Research and Extension on Emerging Soybean Pests in the North Central Region. North Central Soybean Research Program \$1,709,837; \$81,629 to Michel PI: K. Tilmon and J. McMechan.
7. 10/2022-09/2023. Research and management of soybean insects FY22. Ohio Soybean Council. \$58,000 total, \$29,000 to Michel. PI: K. Tilmon, Co-PI: **A. Michel**.

STUDENT MENTORING

I have successfully mentored 7 PhD students with one starting in August of 2023. I have had 1 Master's student finish their degree with two current Master's students that will transition to the Ph.D. program in 2024. Many of my students have received several awards: two students were awarded the OSU Presidential Fellowship (2014-2015 and 2019-2020), two students were awarded the Entomological Society's Plant Resistance to Insects Graduate Research award (2014 and 2018), one student received OSU's first Foundational for Food and Agricultural Research Graduate Fellowship, and five received CFAES SEEDS graduate research funding.

Doctoral Student Advisor:

1. Danna Vera, Entomology *Aug 2023- Present*
-Impact of climate on fall armyworm (*Spodoptera frugiperda*) on alfalfa and forage production
2. Ana Trabanino, Entomology *Jan 2018-: Dec 2022*
-Current Status: Research Scientist, Corteva Ag Sciences
-Improving IRM for fall armyworm (*Spodoptera frugiperda*)
3. Carlos Esquivel Palma (Co-Advisor), Entomology, *Aug 2015-Dec 2019*
-Current status: Research Scientist, Bayer Crop Sciences

- Awarded Graduate Research Grant (OARDC-SEEDS), \$3,000, *Jun 2016*
- The Ohio State University Presidential Fellowship (2019-2020)
- Received multiple awards from Entomological Society of America (ESA) student competitions and other professional society meetings
- 4. Ashley Yates-Stewart (Primary Advisor, co-Advised by Dr. J Blakeslee), Translational Plant Sciences Graduate Program, *Aug 2014-Dec 2019*
 - Current Status: Research Scientist, Bayer Crop Science
 - Awarded ESA P-IE Starks Graduate Student Award for Host-Plant Resistance, *Nov 2018*
 - USDA-NIFA Pre-doctoral Research Fellowship, *Mar 2017*
 - Ohio Soybean Council Graduate Research Award, *Mar 2016*
 - Awarded Graduate Research Grant (OARDC-SEEDS), \$3,000, *Jun 2016*
- 5. Priyanka Mittapelly, Entomology, *Jan 2014-Dec 2018*.
 - Current Status: Post-Doctoral Researcher, University of Alberta
 - Awarded Graduate Research Grant (OARDC-SEEDS), \$3,000, *Jun 2016*
- 6. Julio Fatoreto Ph.D., *Aug 2013-April 2017*, Dual-Degree, Translational Plant Sciences. (Co-Advised by Dr. Marcio de Castro Silva Filho, University of São Paulo)
 - Current Status: Research Scientist, Bayer Crop Science
 - First OSU/USP dual-degree student to earn Ph.D. in program
- 7. Jacob Wenger, Ph.D., Entomology *Sept 2010-Sep 2015*
 - Current Status: Assistant Professor, Fresno State University
 - The Ohio State University Presidential Fellowship (2014-2015)
 - NSF K-12 Graduate Research/Teaching Fellowship (2012-2014).
 - Awarded ESA P-IE Starks Graduate Student Award for Host-Plant Resistance, 2014
 - Awarded President's Prize, 2nd place, student competition, ESA, 2011 & 2012
 - Awarded Graduate Research Grant (OARDC-SEEDS), \$3,000, *Jun 2012*
 - Awarded Ray Travel Award (OSU), \$750, *Aug 2012*
- 8. Yuting Chen Ph.D., Entomology *Sep 2009-December 2013*
 - Awarded Graduate Research Grant (OARDC-SEEDS), \$5,000, *Jun 2010*
 - Current Status: Research Scientist, GreenLight Biosciences

Master's Student Advisor:

1. Angel Haller, Entomology *Aug 2022* *will transition to the Ph.D. Program in 2024
2. Yamikani Ng'ona, Entomology *Aug 2022* *will transition to the Ph.D. Program in 2024
3. Lucia Orantes, Entomology *Mar 2009-Graduated Aug 2011*
 - Awarded Graduate Research Grant (OARDC-SEEDS), \$3,000, *Jun 2010*
 - Current Status: Epidemiologist, State of Vermont

Master of Plant Health Management Advisor:

James Morris, *Graduated Apr 2022*

Jason Hartschuh, *Graduated Nov 2014* (Co-Advised by Dr. Pierce Paul)

Masters and Doctoral Student Advisory Committee (Past and Current): 16 Doctoral students and 10 Master's students at OSU, Purdue University, Penn St. University and the University of Guelph

Post- Doctoral Research Associates:

1. Maggie Lewis, *Aug 2021-Present*.
2. Vitor Correa Pavinato, *Jun 2015- Jun 2016; Jul 2019-Apr 2023*
3. Hilary Edgington, *Sep 2017- July 2019*, Current: Visiting Asst. Professor, College of Wooster
4. Aline Sartori Guidolin, *Mar 2017-July 2018*, Current: Post-Doc, University of Sao Paulo
5. Swapna Priya Rajarapu, *Nov 2016-Dec 2018*, Current: Post-Doc, University of North Carolina
6. Raman Bansal, *Nov 2009-March 2015*, Current: USDA-ARS Res. Scientist
7. Sungwoo Lee, *May 2013-Jan 2015*. Current: Assistant Professor, Chungnam National University, South Korea.
8. Tae-Hwan Jun, *Apr 2009-Aug 2013*. Current: Assistant Professor, Pusan National University, South Korea

Visiting Scientists:

1. Frederico Hickmann, University of São Paulo, Brazil. *Feb 2022-Jan 2023*
2. Nathalia Cavichioli de Oliveira, University of São Paulo, Brazil. *Aug 2019-Sep 2020*
3. Abdelhadi Sabraoui, ICARDA-Morocco, *Aug 2018-Aug 2019, Apr. 2020-Jul 2020*
4. Rogerio Nascimato, ESALQ, University of São Paulo, Brazil, *Sep 2016-Sep 2017*
5. Xianlinag Huang, Northwest Agricultural and Forestry University, Shaanxi, China. *Nov 2016-Dec 2017*
6. Natalia Alves Leite, ESALQ, University of São Paulo, Brazil, *Sept 2015-Jan 2016*
7. Laura Izascum, University of Guadalajara, Mexico, *Aug 2014-Nov 2014*
8. Julio Faretto, ESALQ, University of São Paulo, Brazil, *Oct 2013-May 2014*
9. Vitor Correa Pavinato, Fulbright Fellow, University de Campinas, Brazil, *Sept 2012-May 2013*
10. T. Michael Kates, Michigan State University *Jan 2011 and Jan 2012*
11. Amanda Bachmann, Penn State University *Sep 2009, Nov. 2010*
12. Lucia Orantes, *Jan 2009-Mar 2009*
13. Nelson Olivas-Daliva, *Feb 2008-Dec 2008*

Undergraduate/Student Research Interns:

1. Nathan Kreuter, College of Wooster, *May 2021-Present*
2. Anna Favalon, Trinity University, *May 2019-Aug 2019*
3. Michelle Chang, College of Wooster, *May 2018- Dec 2018*
4. Daniel Huang, High school student, *Jun-Aug 2015*
5. Hannah Lee, High school student, *Jun-Aug 2014*
6. Monica Ramstad, Undergraduate student, *Jun-Aug 2012*
7. Rakin Rouf, Undergraduate student, *Jun-Aug 2010*
8. Geoff Parker, Undergraduate student, *Jun-Aug 2009*
9. Nikhil Vasudeva, High school student, *Jun-Aug 2008*

RESEARCH SEMINARS AND PRESENTATIONS

Invited Speaker (37 total since 2007, last 5 years listed), 24 other presentations and posters (author and co-author, full list upon request):

1. **Michel A.** Molecular Interactions between Soybean Aphids and Aphid-Resistant Soybean. Soybean breeders workshop (virtual). *Mar. 2021*
2. **Michel A.** Genomic inferences on overcoming aphid-resistant soybean in the soybean aphid. Entomological Society of America Annual Meeting (virtual). *Dec. 2020*.
3. **Michel A.** Insect adaptation to resistant plants: Case studies in fall armyworm and the soybean aphid. Dep. of Entomology, The Ohio State University. *Aug 2020*.
4. **Michel A.** Molecular Interactions between Soybean Aphids and Aphid-Resistant Soybean. International Plant Resistance to Insects Workshop, Mexico City. *Mar 3*.
5. **Michel A.** Molecular Interactions between Soybean Aphids and Aphid-Resistant Soybean. Plant Animal Genomics Conference, San Diego. *Jan 2020*
6. **Michel A.** Soybean Aphid Adaptation to Aphid-Resistant Soybean. Dept. of Entomology, Iowa State University. Ames, IA. *Oct 2017*

EXTENSION

Extension activities focus on improving integrated pest management for agronomic crops. My program engages with OSU Extension Educators, commodity organizations, federal agencies, other university extension specialists and industry. In 2016, I was part of a team that documented resistance in western bean cutworm. These data convinced industry to remove the pest from their labels, and helped initiate a review of caterpillar resistance to transgenic crops. My program, along with Dr. Kelley Tilmon (ENT), Dr. Ashley Leach (ENT) and Dr. Horacio Lopez-Nicora (PlantPath), has developed novel, 3D printing models for extension. We have developed models to improve extension activities for scouting, and tools to help monitor for invasive pests or guide management decisions.

Figure 1. 3D printed models for extension. A) spotted lanternfly egg mass to improve stakeholder scouting; B) cereal leaf beetle larvae (red circle) on wheat leaf (maybe fooled a lady beetle larvae thinking it was prey?); C) soybean defoliation tool to estimate 10%, 15% and 30% defoliation



Presentations (last 5 years listed, full list available upon request)

2023:

1. Corn and Soybean Insect update for 2023. Western Agricultural Research Station Field Day. July 19. 75 participants.
2. Field crop insect update for 2022 and 2023. Pesticide Applicator Training, Akron OH. Jan 12. 50 participants.

3. CFAES Admin Update and Managing caterpillars in sweet corn. Muck Crops Field Day. Jan 5. 75 participants.

2022:

1. 3D Printing for Extension. Ohio State University Extension Educator Inservice. Dec. 13. 100 participants.
2. How weather events could impact crop pests and pathogens. Ohio AgBusiness Association Industry Conference *Jan 27, virtual*
3. Corn Insect Management. 2022 Corn and Soybean Virtual Program. *Feb. 15.*
4. Field Crop Insects Update 2022. Pesticide Applicator Training. Dayton, OH. *Feb 23.* 100 Participants
5. Insect Management for Wheat. OSU Wheat and Small Grains Agronomy Day. *Jun 14*

2021:

1. Field Crop Insects Update 2021. OSU Educator Inservice. Columbus, OH. *Dec 14.* 100 Participants
2. Scouting in Soybean and for Bt resistance in corn. Southwest Ohio Corn Growers Field Day. Washington Court House, OH. *Aug 17.* 50 Participants
3. Insect Management in Field Crops. Pesticide Applicator Training. Virtual. *Feb. 23*
4. Corn and Wheat Insect Management, Conservation Tillage Conference. Virtual. *Feb 18*
5. Corn Insect Management. 2021 Corn and Soybean Virtual Program. *Feb. 11.*
6. Bt's Be Gone: Risks of insect resistance to Bt. OSUE Agricultural and Natural Resources Educator Inservice. Virtual. *Jan 28.*

2020:

1. Insect Management Update. Pesticide Applicators Training (PAT) Recertification Field Crop Conference. Sandusky, OH. *Jan 24.* 100 Participants
2. Insects on Small Grains: worms, aphids, beetles Oh My! Auglaize County Small Grains Workshop. *Jan 9,* 30 Participants.
3. Worms in my ears: controlling caterpillars in corn. Huron County Extension Agronomy Day. *Jan 8.* 75 Participants

2019:

1. Stink bugs and defoliators in soybean. OSU Western Ag Research Station Field Day. South Charleston, OH. *Jul 17* 75 Participants.
2. Insect Update for 2017/2018. Pesticide Applicators Training (PAT) Recertification Field Crop Conference. Sandusky, OH. *Feb 22* 100 Participants
3. Insect Management in Soybean. Carroll County Agronomy School. Carrollton, OH. *Feb 21.* 50 Participants
4. Insect Management in Soybean. NE Ohio Agronomy School. Bristolville, OH. *Feb 20.* 100 Participants
5. Testing for Bt using test strips. OARDC Agronomy School. Wooster, OH. *Feb 8.* 20 Participants
6. Managing insects without Bt. Ohio Ag Business Association. Columbus, OH. *Jan 31.* 80 Participants
7. Insect Update for 2017/2018. Pesticide Applicators Training (PAT) Recertification Field Crop Conference. Akron, OH. *Jan 15.* 25 Participants

2018:

1. Scouting for Insects in Corn. IPM Scouting School. Ashtabula, OH. *Jul 18* 50 participants

2. Scouting for Insects in Corn. IPM Scouting School-Western Agricultural Research Station. *Jul 18* 30 participants
3. Insect Update for 2017/2018. Pesticide Applicators Training (PAT) Recertification Field Crop Conference. Sandusky, OH. *Feb 15* 100 Participants
4. Insect Update for 2017/2018. Pesticide Applicators Training (PAT) Recertification Field Crop Conference. Dayton, OH. *Jan 11* 100 Participants

Popular Publications

1. **Co-Author on over 400 articles in OSU-Extension Agronomic Crops Team's CORN Newsletter (citations available on request, see <http://corn.osu.edu/>)**
2. On the hunt for kudzu bugs in Ohio. Ohio Soybean News, Summer 2014.
3. Early season pests are out in force around Ohio. Ohio Country Journal. Mid-June 2014.
4. Protecting bees during spring planting. Crop News Weekly. Corn and Soybean Digest. April 3, 2013. http://enewspro.penton.com/preview/cropnewsweekly/SO-02/20130403_SO-02_453/display
5. Hammond, R. B., and A. Michel. 2013. Insecticide seed treatments on field crops. Leader Letter, Ohio Soybean Assoc., May 2013.
6. Hammond, R. B., and A. Michel. 2013. Catch the Buzz - Don't Spray Beans In Bloom. Bee Culture Blog. July 2013
7. Michel, A., and R. B. Hammond. 2013. Check corn roots for signs of resistant western corn rootworm. Ohio's Country Journal August 2013.
8. Michel, A., and R. B. Hammond. 2013. Mid-summer pest update. Ohio's Country Journal August 2013.
9. Hammond, R. B., and A. Michel. 2013. Late Season Insect Concerns. Ohio Soybean News, Ohio Soybean Association, Summer II, 2013.
10. Michel, A., and R. B. Hammond. 2012. The search is on for invasive bugs in Ohio. Ohio Soybean News, Summer II 2012.
11. Hammond, R. B., and A. Michel. 2012. Stink bugs showing up in soybeans. Ohio's Country Journal. September 2012
12. Michel, A., and R. B. Hammond. 2012. The search is on for invasive bugs in Ohio. Ohio's Country Journal. September 2012
13. Hammond, R. B., and A. Michel. 2012. Southern corn rootworm in soybean. Ohio Soybean Associate Leader Letter. September/October 2012
14. Hammond, R. B., and A. Michel. 2012. Fall populations of soybean aphids non-existent. Ohio's Country Journal. Mid-November 2012
15. Michel, A., and R. B. Hammond. 2012. Will the two year soybean aphid cycle last? Ohio Soybean News. Winter 2012.
16. A. Michel. Dec 2012. "Reporting website for overwintering brown marmorated stink bug" (Newspaper Article). Ohio Country Journal.
17. R. Bansal and A. Michel. Dec 2012. "Fact-Finding on the Risk of Kudzu Bugs in Ohio" (Magazine Article). Ohio Soybean News.
18. R. Bansal and A. Michel. Nov 2012. "Fact-Finding on the Risk of Kudzu Bug in Ohio" (Magazine Article). Ohio Soybean Association Leader Letter.
19. Michel, A., R. Bansal, M. A. Mian, and R. B. Hammond. 2013. Using soybean aphid resistant varieties. Ohio Soybean News, Ohio Soybean Association Leader Letter,

- July/August, 2013. A. P. Michel “Current Status of Soybean Aphid Biotypes” Ohio Soybean Council Bulletin, 2010
20. Hammond, R.B. and **A. P. Michel**. “Soybean Aphids in Ohio.” Ohio Soybean Council Bulletin, 2009.
 21. Hammond, R., **A. P. Michel**, and B. Eisley. Corn rootworm control in 2009. January, 2009. Ohio's Country Journal.
 22. Hammond, R., R. Mian, **A. P. Michel**, B. Eisley, A. Dorrance, D. Mills, B. Meiring, G. Arnold, and M. Koenig, 2008 Ohio pest research highlights. January, 2009. Ohio's Country Journal.
 23. Hammond, R., **A. P. Michel**, B. Eisley, Updated IPM and Insects. February, 2009. AG Professional. http://agprofessional.com/show_story_du.php?id=56878.
 24. Hammond, R. B., and **A. P. Michel**. Researching ways to manage the soybean aphid. September, 2009. Soybean Review.
 25. Hammond, R., **A. P. Michel**, and B. Eisley. 2007. Transgenic corn and refuge requirements. Ohio's Country Journal. December, 2007.

TEACHING

1. ENT7930: Scientific Writing. *Autumn 2013* (co-taught with Dr. Susan Jones), *Autumn 2015* (co-taught with Dr. Elizabeth Long)
2. ENT6940: Insect Ecology and Evolutionary Processes (co-taught with Dr. Dan Herms and Dr. Mary Gardiner). *Autumn 2010, 2012, 2014, 2016*
3. HCS830: Plant Domestication (co-taught with Dr. Esther van der Knapp). *Winter 2011*.
4. ENT795: Molecular Agroecology: Overview of Population Genetic and Molecular Ecology Techniques for Agriculturally Related Species. *Summer 2010*
5. EEOB 881.04: Seminar in Analysis of Population Genetic Data. Contributed to lectures and analyses, *Autumn 2007*

SERVICE

Department

1. Entomology/Plant Pathology Search Committee, Turfgrass Health, Co-Chair, *Apr-Oct 2022*
2. Chair, Entomology Graduate Studies Committee, *Oct 2013-May 2016*
3. Entomology Faculty Search Committee, Agronomic Crops Insects, Chair, *Oct 2014-2015*
4. Entomology Faculty Search Committee, Veterinary/Livestock Ent., Co-Chair, *April 2010-Jan 2011*
5. Entomology Administrative Advisory and Planning Committee, *Jan 2010-Present*
6. Entomology Seminar Committee, Chair, *Oct 2009- Dec 2011*
7. Entomology Graduate Committee, *2009-2011*
8. Judge for DeLong Award Competition, Dept. of Entomology, OSU, *May 2008, 2010*
9. “A Bugs World” contributor for Agricultural Ecology and Beetle Blitz, *Apr 2008-Present*
10. Entomology Graduate Curriculum Committee, *2008-2009*
11. Entomology Faculty Search Committee, Molecular Insect-Plant Interactions *Sep 2007-Apr 2008*
12. Entomology Social Committee (Wooster), *2007-2009*

University

1. CFAES Dean Reappointment Advisory Committee, *2021-2022*
2. Chair, Molecular and Cellular Imaging Center Strategic Planning Committee, CFAES Wooster Campus (*Feb 2020- Nov 2021*)
3. Chair, CFAES Wooster Campus Strategic Planning Committee for Greenhouses (*June 2020- Nov 2021*)
4. OARDC-SEEDS Research Committee, 2011-2015 (Chair, 2014-2015)
5. OARDC-MCIC Faculty Advisory Committee, *Apr 2009-Present*
6. OARDC Faculty Research Awards Committee: *Oct 2008-Oct 2011*
7. OSU Roads Scholar Program, *Sep 9-10, 2009*

Professional Societies & Meetings

1. President, Entomological Society of America North Central Branch, *Mar 2019-Mar 2020*
2. Secretary, Entomological Society of America, P-I E Section, *Nov 2013-Nov 2016*
3. Co-Author, Resistance Management in GM Crops Position Statement, Entomological Society of America Science Policy Committee
4. Student Awards Committee for Entomological Society of America, North Central Branch, *2008-Present*
5. Symposium co-Organizer and co-Moderator, Management of Soybean Aphid in North America: Current Research and Future Prospects.” ESA-NCB Meeting, *Mar 2011*
6. Symposium co-Organizer and co-Moderator, “Insect Scientist/Plant Breeder Interactions: Working Together Towards Host Plant Resistance in Soybeans.” ESA National Meeting, *Dec 2009*
7. Judge for Plant-Insects and Ecosystem Student Competition, ESA National Meeting, *Dec 2009*
8. Judge for Plant-Insects and Ecosystem Student Competition, ESA-NCB Meeting, *Mar 2009*
9. Judge for Plant-Insects and Ecosystem Student Competition, ESA National Meeting, *Nov 2008*
10. Symposium Organizer and Moderator, “Genetics and Genomics of Agronomic Pests: From Populations to Individuals to Genes.” Entomological Society of America, *Mar 2008*
11. Gamma Sigma Delta Ohio State Chapter, Vice President (2010), and President (2011) *2010-Present*
12. Moderator, Student Competition, Systematics, Morphology & Evolution
13. Entomological Society of America, *Dec 2006*
14. Moderator, Speciation Symposium
15. Society for the Study of Evolution, *Jun 2006*
16. Graduate Student Paper Competition Judge, *Apr 2006*
17. International Plant Resistance to Insects

Editorial Positions and Ad Hoc Reviews

Current Opinion in Insect Science, Editorial Board, *Dec 2013-Present*

Editor, *Neotropical Entomology*, *Sept 2014-Present*

Journal of Medical Entomology, Editorial Board, *Dec. 2009-Dec 2013*

PNAS, BMC: Genomics, BMC Evolutionary Biology, PLoS:ONE, Heredity, Journal of Heredity, American Journal of Tropical Medicine & Hygiene, Medical and Veterinary Entomology,

Molecular Ecology, Bulletin of Entomological Research, Journal of the Kansas Entomological Society, Environmental Entomology, Agricultural and Forest Entomology, Entomologia Experimentalis et Applicata, Acta Tropica, Infection, Genetics and Evolution, National Health Laboratory Service Research Trust (research proposal review), Agri-Food Canada (research proposal review), University of Guelph (research proposal review), National Science Foundation, DEB (research proposal review).

Professional Memberships

Member, Entomological Society of America, *Jun 2006-Present*

Regional Committees

Michel A.P. NC-246: Ecology and Management of Arthropods in Corn. 2009-Present (Secretary 2016; Vice President, 2017; President 2018)

Michel A. P. S-1039. Biology, Impact, and Management of Soybean Insect Pests in Soybean Production Systems. 2009-Present (President, Feb 2012-Mar 2013, Secretary, Feb. 2011-Present)

Michel A. P. NCERA-213: Migration and Dispersal of Agricultural Biota. 2007-2013 (Secretary and Treasurer, Oct 2008-Oct 2009; Vice-President, Oct 2009-2010; President Oct. 2010-2013)

APPENDIX 1 —COMPLETE LIST OF PUBLICATIONS **PEER REVIEWED PUBLICATIONS (106 total, 98 @ OSU)**

1. Farhan J, Smith JL, Sovic MG, Michel AP. 2023. Genetic mutations linked to field-evolved Cry1Fa-resistance in the European corn borer, *Ostrinia nubilalis*. *Scientific Reports*. 13:8081.
2. Edgington H. Pavinato VAC, Spacht D, Gantz JD, Convey P, Lee RE, Denlinger DL, Michel A. 2023. Genetic history, structure and gene flow among populations of *Belgica antarctica*, the only free-living insect in the western Antarctic Peninsula *Polar Science*. 36: 100945.
3. Hong, Z, Michel A, Long E. 2023. Optimizing a rapid LAMP assay for discrimination of *Drosophila suzukii* (Diptera: Drosophilidae) from common drosophilids captured in monitoring traps from the Midwest, USA. *Journal of Economic Entomology*. 116: 1391-1397.
4. Devlin J, Unfried L, Lecheta M, McCabe E, Gantz JD, Kawarasaki Y, Elnitsky M, Hotaling S, **Michel A**, Convey P, Hayward S, Teets N. 2022. Simulated winter warming negatively impacts survival of Antarctica's only endemic insect. *Functional Ecology*. Accepted.
5. Ribeiro AV, Aita RC, Pezzini DT, DiFonzo CD, Hunt TE, Knodel JJ, Krupke CH, Marchi-Werle L, **Michel AP**, Seiter NJ, Wright RJ, Hutchison WD and Koch RL. 2022. Optimization of sample unit size for sampling stink bugs (Hemiptera: Pentatomidae) in soybean. *Crop Protection*. 157: 105986.
6. Bezerra do Nascimento AR, Pavinato VAC, Rodrigues JG, Silva-Brandão KL, Consoli FL, **Michel A**, Omoto C. 2022. There is more than chitin synthase in insect resistance to benzoylureas: Molecular markers associated with teflubenzuron resistance in *Spodoptera frugiperda*. *Journal of Pest Science*. 95:129-144.

7. Esquivel CJ, Cañas LA, Tilmon KJ and **Michel A.** 2021. Evaluating the role of insecticidal seed treatment and refuge for managing soybean aphid virulence. *Pest Management Science*. 77: 2924-2932.
8. Tilmon KJ, **Michel A.**, and O'Neal ME. 2021. Aphid resistance is the future for soybean production, and has been since 2004: Efforts towards a wider use of host plant resistance in soybean. *Current Opinion in Insect Science*. 45: 53-58.
9. Bansal R, Mian MAR, Michel A. 2021. Characterizing Resistance to Soybean Aphid: Antibiosis and Antixenosis Assessment. *Journal of Economic Entomology*. 114: 1329-1335.
10. Carlesso Aita R, et al. 2021. Presence–Absence Sampling Plans for Stink Bugs (Hemiptera: Pentatomidae) in the Midwest Region of the United States. *Journal of Economic Entomology*. 114:1362-1372.
11. Yates-Stewart AD, Pekarick A, **Michel A.**, Blakeslee JJ. Jasmonic acid-isoleucine (JA-Ile) is involved in the host-plant resistance mechanism against the soybean aphid (Hemiptera: Aphididae). *Journal of Economic Entomology*. Accepted.
12. Esquivel CJ, Martinez EJ, Baxter R, Trabanino R, Ranger CM, **Michel A.**, Cañas LA. Thiamethoxam differentially impacts survival of the generalist predators, *Orius insidiosus* and *Hippodamia convergens*, when exposed via the food chain. 2020. *Journal of Insect Science*. 20:13.
13. Cordeiro EMG, Pantoja-Gomez LM, de Paiva JB, Nascimento ARB, Omoto C, **Michel AP.**, Correa AS. 2020. Hybridization and introgression between *Helicoverpa armigera* and *H. zea*: an adaptational bridge. 20:61. *BMC Evolutionary Biology*.
14. Yates-Stewart AD, Daron J, Wijeratne S, Slotkin RK, **Michel A.** 2020. Soybean aphids adapted to host-plant resistance by down regulating putative effectors and up regulating transposable elements. *Insect Biochemistry and Molecular Biology*. 121: 103363.
15. Coates et al. 2020. Genome scan detection of selective sweeps among biotypes of the soybean aphid, *Aphis glycines*, with differing virulence to resistance to *A. glycines* (*Rag*) traits in soybean, *Glycine max*. *Insect Biochemistry and Molecular Biology*. 124: 103364.
16. Murúa MG, Vera MA, **Michel A.**, Casmuz AS, Faretto J, Gastaminza G. 2019. Performance of field-collected *Spodoptera frugiperda* (Lepidoptera: Noctuidae) strains exposed to different transgenic and refuge maize hybrids in Argentina. *J. Insect Sci.* 19:21.
17. Smith JL, DiFonzo CD, Baute TS, **Michel AP.**, Krupke CK. 2019. Ecology and management of the western bean cutworm (Lepidoptera: Noctuidae) in corn and dry beans – Revision with focus on the Great Lakes region. *Journal of Integrated Pest Management*. 10:27.
18. Izascum Pérez-Valencia L, **Michel AP.**, Moya-Raygoza G, Rodríguez A. 2019. Genetic variation and structure of *Diaphorina citri* (Hemiptera:Liviidae) in populations from México. *Annals of the Entomological Society of America*. 112: 379–387.
19. Mittapelly P, Bansal R, **Michel A.** Differential expression of cytochrome P450 CYP6 genes in the brown marmorated stink bug, *Halyomorpha halys* (Hemiptera: Pentatomidae). 2019. *Journal of Economic Entomology*. 112: 1403-1410.
20. Esquivel CJ, Ranger CM, Phelan L, Martinez EJ, Hendrix WH, Cañas LA, and **Michel AP.** 2019. Weekly survivorship curves of soybean aphid biotypes 1 and 4 on insecticidal seed-treated soybean. *Journal of Economic Entomology*. 112: 712–719.
21. Pérez-Alquicira J, **Michel A.**, van der Knaap EE, Mercer K, Mitchell T, McHale L, Luna-Ruiz J, Texocotitla-Vázquez E, Vargas-Ponce O. 2019. Genetic structure of *Liriomyza trifolii* (Diptera: Agromyzidae) associated with host plants from southeastern Mexico. *Environmental Entomology*. 48: 253–262.

22. Angelella G, **Michel A**, and Kaplan I. 2019. Using host-associated differentiation to track source population and dispersal distance among insect vectors of plant pathogens. *Evolutionary Applications*. 12: 692-704.
23. Taitano N, Bernau V, Barbolla L, Leckie B, Mazourek M, Mercer K, McHale L, **Michel A**, Baumler D, Kantar M, van der Knaap E. 2019. Genome-wide genotyping of a novel Mexican Chile pepper collection illuminates the history of landrace differentiation after *Capsicum annuum* L. domestication. *Evolutionary Applications*. 12:78-92.
24. Ng S, Dorrance AE, **Michel AP**, Lindsey L. 2018. Effect of Mid-Season Foliar Fungicide and Foliar Insecticide Applied Alone and In-Combination on Soybean Yield. *Crop and Soils Magazine*. July-August: 52-58.
25. Yates AD, **Michel AP**. 2018. Mechanisms of aphid adaptation to host plant resistance. *Current Opinion in Insect Science*. 26: 41-49.
26. Piermarini PM, Inocente EA, Acosta N, Hopkins CR, Denton JS, **Michel AP**. 2018. Inward rectifier potassium (Kir) channels in the soybean aphid *Aphis glycines*: Functional characterization, pharmacology, and toxicology. *Journal of Insect Physiology*. 110:57-65.
27. Hanson AA, Lorenz AJ, Hesler LS, Bhusal SJ, Bansal R, **Michel AP**, Jiang GL, Koch RL. 2018. Genome-Wide Association Mapping of Host-Plant Resistance to Soybean Aphid. *Plant Genome*. 11: 10.3835.
28. Murúa MG, Vera MA, Herrero MI, Fogliata SV, **Michel AP**. 2018. Defoliation of Soybean Expressing Cry1Ac Against Lepidopteran Pests. *Insects*. 9: E93
29. Bansal R, **Michel AP**. 2018. Expansion of cytochrome P450 and cathepsin genes in the generalist herbivore brown marmorated stink bug. *BMC: Genomics*. 19:60.
30. ESA Position Statement on Insect Resistance Management for Genetically Modified Crops. 2018. *Annals of the Entomological Society of America*. 111:3-5.
31. Pavinato VAC, **Michel AP**, de Campos JB, Omoto C, Zucchi M. 2018. Influence of historical land use and modern agricultural expansion on the spatial and ecological divergence of sugarcane borer, *Diatraea saccharalis* (Lepidoptera: Crambidae) in Brazil. *Heredity*. 120:25-37.
32. Faretto JC, **Michel AP**, Silva Filho MC, Silva N. 2017. Adaptive potential of fall armyworm limits Bt trait durability in Brazil. *Journal of Integrated Pest Management*. 8: 17.
33. Koch RL, **Michel AP**, Hunt T. 2017. Identification, biology, impacts and management of stink bugs (Hemiptera: Heteroptera: Pentatomidae) of Soybean and Corn in the Midwestern United States. *Journal of Integrated Pest Management*. 8: 11.
34. Lee S, Cassone BJ, Wijeratne A, Jun T-H, **Michel AP**. 2017. Transcriptomic dynamics in soybean near-isogenic lines differing in alleles for an aphid resistance gene, following infestation by soybean aphid biotype 2. *BMC: Genomics*. 18(1):47.
35. Leite NA, Correa AS, **Michel AP**, Alves-Pereira A, Pavinato VAC, Zucchi MI, Omoto C. 2017. Intra- and interspecific gene flow of *Helicoverpa armigera* and *H. zea* (Lepidoptera: Noctuidae) in the Americas. *Environmental Entomology*. 46:1024-1034
36. Koch R, Potter B, Glogoza P, Hodgson E, Krupke C, Tooker J, DiFonzo C, **Michel A**, Tilmon K, Prochaska T, Knodel J, Wright R, Hunt T, Jensen B, McCornack B, Estes K, Spencer J. 2017. Biology and economics of recommendations for insecticide-based management of soybean aphid. *Plant Health Progress*. 17:265-269.
37. Wenger JA, Cassone B, Cassone BJ, Legeai F, Johnston JS, Bansal R, Yates AD, Coates BS, Pavinato VAC, **Michel A**. 2017. Whole genome sequence of the soybean aphid, *Aphis glycines*. *Insect Biochemistry and Molecular Biology*. doi: 10.1016/j.ibmb.2017.01.005.

38. Pavinato VAC, Margarido GRA, Wijeratne AJ, Wijeratne S, Meulia T, Souza AP, **Michel AP** and Zucchi MI. 2017. RAD (Restriction site Associated DNA) for *de novo* sequencing and marker discovery in sugarcane borer, *Diatraea saccharalis* Fab. (Lepidoptera: Crambidae). *Molecular Ecology Resources*. 17:454-465.
39. Gunadi A, Bansal R, **Michel AP**, Finer JJ. 2016. Establishment and utility of in vitro soybean aphid culture, *Aphis glycines* (Hemiptera: Aphididae). *Pest Management Science*. 73: 1229-1235.
40. Bansal R, Mittapelly P, Chen Y, Mamidala P, Zhao C, **Michel A**. 2016. RNA interference and quantitative RT-PCR gene evaluation in the brown marmorated stink bug. *Plos:One*. 11(5): e0152730.
41. Stewart S, Roberston AE, Wickramasinghe D, Draper MA, **Michel A**, Dorrance AE. 2016. Population structure among and within Iowa, Missouri, Ohio, and South Dakota Populations of *Phytophthora sojae*. *Plant Disease*. 100: 367-379.
42. Mian MAR, McHale LK, **Michel AP**, Dorrance AE. 2016. Registration of ‘Wyandot-14’ Soybean with Resistance to Soybean Aphid and Powdery Mildew. *Journal of Plant Registrations*. Vol 10: 246-250.
43. Cassone BJ, Wenger JA, **Michel AP**. 2015. Whole genome sequence of the soybean aphid endosymbiont *Buchnera aphidicola* and genetic differentiation among biotype-specific strains. *Journal of Genomics*. 3: 85–94.
44. Cassone BJ, Redinbaugh MG, Dorrance AE, **Michel AP**. 2015. Shifts in *Buchnera aphidicola* density in soybean aphids (*Aphis glycines*) feeding on virus-infected soybean. *Insect Molecular Biology*. 24:422-3.
45. Chen Y, Redinbaugh MG, **Michel AP**. 2015. Molecular interactions and immune responses between Maize fine streak virus and the leafhopper vector *G. nigrifrons* through differential expression and RNA interference. *Insect Molecular Biology*. 24(3):391-401.
46. Flagel LE, Swarup S, Chen M, Bauer C, Wanjugi H, Carroll M, Hill P, Tuscan M, Bansal R, Flannagan R, Clark TL, **Michel AP**, Head GP, Goldman BS. 2015. Genetic markers for western corn rootworm resistance to Bt toxin. *G3: Genes | Genomes | Genetics*. 2015 Jan 7. pii: g3.114.016485.
47. Acharya B, Lee S, Rouf Mian MA, Jun TH, McHale LK, **Michel AP**, Dorrance AE. 2015. Identification and mapping of quantitative trait loci (QTL) conferring resistance to *Fusarium graminearum* from soybean PI 567301B. *Theor and Appl Gen*. 2015 Feb 18.
48. Lee S, Freewalt KR, McHale LK, Song Q, Jun T-H, **Michel AP**, Dorrance AE, Mian MAR. 2015. A high-resolution genetic linkage map of soybean based on 357 recombinant inbred lines genotyped with BARCSoySNP6K. *Molecular Breeding*. 35:58.
49. Lee, S., Jun, T.H., Michel, A.P., Mian, M.A.R. 2015. SNP markers linked to QTL conditioning plant height, lodging, and maturity in soybean. *Euphytica*, (3), 521-532.
50. Bautista MA, Bhandary B, Wijeratne AJ, **Michel AP**, Hoy CW, Mittapalli O. 2015. Evidence for trade-offs in detoxification and chemosensation gene signatures in *Plutella xylostella*. *Pest. Manag. Sci.*. 71:423-432.
51. Bansal R, Mittapelly P, Cassone BJ, Mamidala P, Redinbaugh MG, and **Michel A**. 2015. Recommended reference genes for quantitative PCR analysis in soybean have variable stabilities during diverse biotic stresses *PLoS:One*. 10(8): e0134890.
52. Cassone BJ, Wenger JA, **Michel AP**. 2015. Whole genome sequence of the soybean aphid endosymbiont *Buchnera aphidicola* and genetic differentiation among biotype-specific strains. *Journal of Genomics*. 3: 85–94.

53. Cassone BJ, Redinbaugh MG, Dorrance AE, **Michel AP**. 2015. Shifts in *Buchnera aphidicola* density in soybean aphids (*Aphis glycines*) feeding on virus-infected soybean. *Insect Molecular Biology*. 24:422-3.
54. Chen Y, Redinbaugh MG, **Michel AP**. 2015. Molecular interactions and immune responses between Maize fine streak virus and the leafhopper vector *G. nigrifrons* through differential expression and RNA interference. *Insect Molecular Biology*. 24(3):391-401.
55. Flagel LE, Swarup S, Chen M, Bauer C, Wanjugi H, Carroll M, Hill P, Tuscan M, Bansal R, Flannagan R, Clark TL, **Michel AP**, Head GP, Goldman BS. 2015. Genetic markers for western corn rootworm resistance to Bt toxin. *G3: Genes | Genomes | Genetics*. 2015 Jan 7. pii: g3.114.016485.
56. Acharya B1, Lee S, Rouf Mian MA, Jun TH, McHale LK, **Michel AP**, Dorrance AE. 2015. Identification and mapping of quantitative trait loci (QTL) conferring resistance to *Fusarium graminearum* from soybean PI 567301B. *Theor and Appl Gen*. 2015 Feb 18.
57. Lee S, Freewalt KR, McHale LK, Song Q, Jun T-H, **Michel AP**, Dorrance AE, Mian MAR. 2015. A high-resolution genetic linkage map of soybean based on 357 recombinant inbred lines genotyped with BARCSoySNP6K. *Molecular Breeding*. 35:58.
58. Lee, S., Jun, T.H., Michel, A.P., Mian, M.A.R. 2015. SNP markers linked to QTL conditioning plant height, lodging, and maturity in soybean. *Euphytica*, (3), 521-532.
59. Bautista MA, Bhandary B, Wijeratne AJ, **Michel AP**, Hoy CW, Mittapalli O. 2015. Evidence for trade-offs in detoxification and chemosensation gene signatures in *Plutella xylostella*. *Pest. Manag. Sci.*. 71:423-432.
60. Bansal R, Mittapelly P, Cassone BJ, Mamidala P, Redinbaugh MG, and **Michel A**. 2015. Recommended reference genes for quantitative PCR analysis in soybean have variable stabilities during diverse biotic stresses *PLoS:One*. 10(8): e0134890.
61. Bansal R, Mian MA, Mittapalli O, **Michel AP**. 2014. Soybean aphid feeding on resistant soybean leads to induction of xenobiotic stress response and suppression of salivary effector genes. *BMC Genomics*. 15:972.
62. Wenger JA, Mian MAR, *Ramstad M, **Michel AP**. 2014. Fitness, movement and competition of soybean aphid biotypes and their impact on a refuge based, host-plant resistance strategy for virulence management. *Journal of Economic Entomology*. 107: 1599–1609. *undergraduate student
63. Bansal R, **Michel AP**, Sabree Z. 2014. The crypt-dwelling primary bacterial symbiont of the polyphagous pentatomid pest *Halyomorpha halys* (Hemiptera: Pentatomidae). *Environmental Entomology*. 43:617-622.
64. Bal H, **Michel AP**, Grewal PS. 2014. Genetic selection of the ambush foraging entomopathogenic nematode, *Steinernema carpocapsae* for enhanced dispersal and its associated trade-offs. *Evolutionary Ecology*. 28:923-939.
65. Flagel LE, Bansal R, Kerstetter RA, Chen M, Carroll M, Goldman BS, **Michel AP**. 2014. Western corn rootworm (*Diabrotica virgifera virgifera*) transcriptome assembly and genomic analysis of population structure. *BMC:Genomics*. 15:195.
66. Cassone BJ, Cisneros Carter FM, **Michel AP**, Stewart LR, Redinbaugh MG. 2014. Genetic insights into *Graminella nigrifrons* competence for maize fine streak virus infection and transmission. *PLoS One*. 9(11): e113529.
67. Cassone BJ, **Michel AP**, Stewart LR, Bansal R, Mian MA, Redinbaugh MG. 2014. Reduction in fecundity and shifts in cellular processes by a native virus on an invasive insect. *Genome Biology and Evolution*. 6(4):873-85.

68. Cassone BJ, Wijeratne S, **Michel AP**, Stewart LR, Chen Y, Yan P, Redinbaugh MG. 2014. Virus-independent and common transcriptome responses of leafhopper vectors feeding on maize infected with semi-persistently and persistent propagatively transmitted viruses. *BMC Genomics*. 15:133.
69. Jun TH, Freewalt K, **Michel AP**, Mian MA. 2014. Identification of novel QTL for leaf traits in soybean. *Plant Breeding*. 133:61-66.
70. Bansal R, Mian MA, **Michel AP**. 2014. Microbiome diversity of *Aphis glycines* with extensive superinfection in native and invasive populations. *Environmental Microbiology Reports*. 6: 57-69.
71. Wenger JA, and **Michel AP**. 2013. Implementing an evolutionary framework for understanding genetic relationships of phenotypically defined insect biotypes in the invasive soybean aphid (*Aphis glycines*). *Evolutionary Applications*. 6:1041-53
72. Bansal R, Mian MA, **Michel AP**. 2013. Identification of novel sources of host plant resistance to known soybean aphid biotypes. *Journal of Economic Entomology*. 3:1479-1485.
73. Bansal R, Mian MA, Mittapalli O, **Michel AP**. 2013. Molecular characterization and expression analysis of soluble trehalase gene in *Aphis glycines*, a migratory pest of soybean. *Bulletin of Entomological Research*. 103:286-295.
74. Bansal R, **Michel AP**. 2013. Core RNAi Machinery and Sid1, a component for systemic RNAi, in the Hemipteran insect, *Aphis glycines*. *Int J Mol Sci*.14:3786-801.
75. Jun TH, Mian MA, **Michel AP**. 2013. Genetic mapping of three quantitative trait loci for soybean aphid resistance in PI 567324. *Heredity*. 111:16-22.
76. Jun TH, **Michel AP**, Wenger JA, Kang ST, Mian MA. 2013. Population genetic structure and genetic diversity of soybean aphid collections from the USA, South Korea, and Japan. *Genome* 56:345-350.
77. Molecular Ecology Resources Consortium. 2012. Permanent Genetic Resources added to Molecular Ecology Resources Database 1 August 2012 - 30 September 2012. *Molecular Ecology Resources*. 13: 158-159.
78. Jun T-H, Mian MAR, Kang S, **Michel AP**. 2012. Genetic mapping of the powdery mildew resistance gene in soybean PI 567301B. *Theoretical and Applied Genetics*. 125: 1159-1168.
79. Bansal R, Mian MAR, Mittapalli O, **Michel AP**. 2012 Characterization of a chitin synthase encoding gene and effect of diflubenzuron in soybean aphid, *Aphis glycines*. *International Journal of Biological Sciences*. 8: 1323-1334.
80. Jun T-H, **Michel AP**, Mian MAR. 2012 Characterization of EST-based microsatellites from the soybean aphid, *Aphis glycines*. *Journal of Applied Entomology*. 136: 614-625.
81. Chen Y, Cassone B, Bai X, Redinbaugh M, **Michel AP**. 2012. Transcriptome of the plant virus vector *Graminella nigrifrons*, and the molecular interactions of Maize fine streak rhabdovirus transmission. *PLoS:One*. 7: e40613.
82. Bansal RB, Mamidala P, Mian MAR, Mittapalli O, **Michel AP**. 2012. Validation of reference genes for gene expression studies in soybean aphid, *Aphis glycines* Matsumura. *Journal of Ecological Entomology*. Vol. 105: 1432-1438.
83. Orantes L, Zhang W, Mian MAR, **Michel AP**. 2012. Maintaining genetic diversity and population panmixia through dispersal and not gene flow in a holocyclic heteroecious aphid species. *Heredity*. 109:127-34.
84. Jun T-H, **Michel AP**, Mian MAR. 2012 Genetic mapping revealed two loci for soybean aphid resistance in PI 567301B. *Theoretical and Applied Genetics*. 124: 13-22.

85. Rodríguez G, Muños S, Anderson C, Sim S-C, **Michel A**, Causse M, McSpadden-Gardener B, Francis D, van der Knapp E. 2011. Distribution of SUN, OVATE, LC and FAS in the tomato germplasm and their role in fruit shape diversity. *Plant Physiology*. 156:275-85.
 86. Jun T-H, **Michel AP**, Mian MAR. Development of soybean aphid genomic SSR markers using next generation sequencing. 2011. *Genome*. May, 54:360-7.
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