

CURRICULUM VITAE

Thomas W. Sappington

Research Entomologist

GS-15

Birthdate: 11-30-57

USDA, Agricultural Research Service
Corn Insects & Crop Genetics Research Unit
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EDUCATION

<u>Institution</u>	<u>Degree</u>	<u>Major (Minor)</u>	<u>GPA</u>	<u>Date</u>
University of Kansas	Ph.D.	Systematics & Ecology	4.00	May 1989
Iowa State University	M.S.	Entomology	3.72	May 1982
Central Missouri State Univ.	B.S.	Biology (<i>Chemistry</i>)	3.83	May 1979

PROFESSIONAL HISTORY

USDA, Agricultural Research Service

Corn Insects & Crop Genetics Research Unit, Ames, IA

Jan. 2003 – present

Research Entomologist (GS-15, 2010; GS-14, 2005)

Iowa State University, Department of Entomology, Ames, IA

Mar. 2003 – present

Affiliate Professor (Full since 2014; previously "Collaborator" under old system)

USDA, Agricultural Research Service

Integrated Farming & Natural Resources Research Unit, Weslaco, TX

Aug. 1998 – Jan. 2003

Research Entomologist/Lead Scientist (Cotton Insects) (GS-13, 2002; GS-12, 1998)

Michigan State University, Department of Entomology, East Lansing, MI

Aug. 1996 – Aug. 1998

Visiting Assistant Professor

Michigan State University, Department of Entomology, East Lansing, MI
Apr. 1992 – Aug. 1996
Visiting Research Associate
Supervisor: Dr. Alexander S. Raikhel

Iowa State University, Department of Entomology, Ames, IA
Feb. 1989 – Mar. 1992
Postdoctoral Research Associate
Supervisor: Dr. William B. Showers

University of Kansas, Department of Systematics & Ecology, Lawrence, KS
Aug. 1984 – Jan. 1989
Ph.D. Graduate Student
Supervisor: Dr. Orley R. Taylor

University of Kansas, Department of Systematics & Ecology, Lawrence, KS
Aug. 1985 – Dec. 1988
Graduate Teaching Assistant
Supervisor: Dr. George Pisani, Director of Undergraduate Laboratories

University of Kansas, Department of Entomology, Lawrence, KS
Jul. 1985 – Aug. 1986
Graduate Research Assistant
Supervisor: Dr. Rudolf Jander

Crop Pro-Tech, Inc., Naperville, IL
May 1982 – Aug. 1984
District Manager/Crop Consultant/Staff Entomologist
Supervisor: David J. Harms, President

Iowa State University, Department of Entomology, Ames, IA
Dec. 1979 – May 1982
Graduate Teaching Assistant
Supervisors: Drs. Larry P. Pedigo, Elwood Hart, Joel Coats, and Elliott Krafusur

Iowa State University, Department of Entomology, Ames, IA
Aug 1979 – Nov. 1979 and Summers 1980, 1981
Graduate Research Assistant
Supervisor: Dr. William B. Showers

SAB/Harmon Industries, Warrensburg, MO
Nov. 1978 – Aug. 1979
Quantitative Chemist
Supervisor: Rod Parker

Central Missouri State University (= U. Central Missouri), Dept. Biology, Warrensburg, MO
Mar. 1976 – May 1979
Entomology Laboratory Assistant, Arachnid Curatorial Assistant
Supervisor: Dr. William B. Peck

HONORS AND AWARDS (ARS, Agricultural Research Service; ESA, Entomological Society of America; ICE, International Congress of Entomology; ISU, Iowa State Univ.; KU, Univ. of Kansas; CMSU, Central Missouri State Univ. [now Univ. of Central Missouri])

Service Recognition – Poster Co-Chair 2016 Annu. Meeting	2016	ESA+ICE
Annual Performance Rating – <i>Outstanding</i> (highest possible)	2001,03-09, 11-13,15,17	ARS
Service Recognition – Program Co-Chair 2015 Annu. Meeting	2015	ESA
Midwest Area Senior Research Scientist of the Year (\$20,000 research support award + \$4,000 cash award)	2014	ARS
Service Recognition – Chair Publications Council	2009	ESA
Osborn Research Club – (outstanding researchers at ISU), elected	2006	ISU
Service Recognition, <i>J. Medical Entomol.</i> Editorial Board	2004	ESA
Service Recognition, Co-Editor <i>Environmental Entomology</i>	2002	ESA
Sigma Xi, The Scientific Research Society – <i>Full Member</i>	1990	ISU
Final Oral Examination for Ph.D. – <i>Honors</i>	1989	KU
Comprehensive Preliminary Oral Exam for Ph.D. – <i>Honors</i>	1987	KU
Graduate School Honors Fellowship, 4-year award	1984-1988	KU
PACE (Premium for Academic Excellence) Scholarship	1979-1980	ISU
<i>Magna Cum Laude</i>	1979	CMSU
The Honor Society of Phi Kappa Phi	1978	CMSU
Tassels (Mortar Board) National College Senior Honor Society	1978	CMSU
Beta Beta Beta, National Biological Honor Society	1977	CMSU
Sigma Zeta, National Science & Mathematics Honor Society	1977	CMSU
Phi Eta Sigma, National Honor Society	1976	CMSU
Regents' Scholarship, 4-year award	1975-1979	CMSU
Honors Program	1975-1979	CMSU
Freshman Honors Program	1975-1976	CMSU

GRANTS (1998-Present):

- \$ 670,675 (total) (\$18,028 indirectly to TWS) – USDA-NIFA, AFRI, Foundational Program, 2018-2020. Factors influencing spatially-explicit monarch population responses in Midwest agroecosystems. Co-PI with S. Bradbury (PI).
- \$ 130,000 – Center for Arthropod Management Technologies (CAMTech), Iowa State University, 2016-2017. Understanding dispersal by western corn rootworm: Effects of larval density on flight, and effect of flight on female reproduction. PI with 1 Co-PI.
- \$ 710,000 (total) (\$189,533 to TWS) – Monsanto, Corn Rootworm Knowledge Grant, competitive grant program, 2014-2017. Estimating Dispersal And Modeling Its Impact On Resistance Remediation In Western Corn Rootworm. Co-PI with M. Caprio (PI).
- \$ 25,000 – USDA-NIFA, AFRI, Foundational Program, Conference Grant 2013-2014. Joint Conference of U.S. Corn Entomologist Technical Committees, International Working Group on *Ostrinia*, and *Diabrotica* Genetics Consortium. PI with 2 Co-PIs.
- \$ 50,000 – Plant Science Institute, Iowa State University, Trans-disciplinary Research Program, Phase I: Team-building Enhancement, 2012-2013. Approaching Crops as

- Ecosystems (ACE): Complex biotic interactions affecting plant health. Co-Director with G. Beatty, ISU Dept. Plant Pathology, with 2 Co-PIs.
- \$ 40,000 – Plant Science Institute, Iowa State University, Trans-disciplinary Research Program, Phase I: Team-building, 2011-2012. Approaching Crops as Ecosystems (ACE): Complex biotic interactions affecting plant health. Co-Director with G. Beatty, ISU Dept. Plant Pathology, with 4 Co-PIs.
- \$ 984,822 (total) (\$45,273 to TWS) – USDA-NIFA, AFRI, Sustainable Bioenergy Research Program, Feedstock Crop Protection, 2011-2016. Preparing for likely below-ground pests of bioenergy crops: genomics of the corn rootworm beetle. Co-PI with H. Robertson (PI).
- In-Kind, Large-Scale DNA Sequencing – GENOSCOPE, Institut de Génomique, 2011-2012. Developing large Expressed Sequence Tag (EST) resources for management of the invasive Western Corn Rootworm, *Diabrotica virgifera virgifera*. Co-PI with T. Guillemaud (PI), INRA, Sophia-Antipolis, France.
- \$ 99,900 – USDA-NIFA, AFRI, Mini-Tool Development Grant 2010-2011. A novel method to detect and assay genetic variation in Lepidoptera. PI with 3 Co-PIs.
- \$ 100,000 – ARS Postdoctoral Associate Program (competitive headquarters funding for a postdoc) 2010-12. Population genetic structuring and gene flow in the 'Tiller Killer', an emerging insect pest of switchgrass grown as biofuel feedstock. Sole PI.
- \$ 400,000 (total) (\$113,095 to TWS) – USDA-CSREES, Biotech Risk Assessment Grant, 2009-2012. Risk of western corn rootworm adaptation to transgenic corn. (Renewal grant.) Co-PI with B. Hibbard (PI), ARS, PGRU, Columbia, MO.
- \$ 749,597 – USDA-CSREES, NRI, 2009-2011. Genomic resources to accelerate western corn rootworm research. PI with 5 Co-PIs.
- \$ 141,739 – DuPont/Pioneer 2009-2011. Investigating the compatibility of integrated pest management and insect resistance management philosophies for protecting the yield potential and durability of Bt maize. Co-PI with L. Lewis (PI), Iowa State University.
- \$ 10,000 – The Cotton Foundation 2008-2009. Establishing a boll weevil population monitoring program for the US Cotton Belt. Co-PI with J. Adamczyk (PI), ARS, BIRU, Weslaco, TX.
- € 973,523 (total) (~\$21,000 to TWS) – French ANR grant, 2006-2010. Study of biological invasions based on intentional and unintentional insect introductions. Co-PI with T. Guillemaud (PI), INRA, France.
- \$ 300,000 (total) (\$5,000 to TWS) – USDA-CSREES, Biotech Risk Assessment Grant, 2006-2009. Risk of western corn rootworm adaptation to transgenic corn. Co-PI with B. Hibbard (PI), ARS, PGRU, Columbia, MO.
- \$ 343,000 – USDA-CSREES, National Research Initiative. 2005-2009. Spatial and temporal characterization of gene flow among European corn borer populations using microsatellite markers. PI with 3 Co-PIs.
- \$ 10,000 – USDA, NRI Conference Grant, 2004-2005. International Conference on *Diabrotica* Genetics, Kansas City, MO, Dec. 13-15, 2004. PI with 1 Co-PI.
- \$ 35,000 – Texas Dept. of Agric. 2002-2003 Impact of various tillage, harvest, seed cotton handling and ginning practices on boll weevil survivability. PI with 1 Co-PI.
- \$ 80,000 – ARS Postdoctoral Associate Program (competitive headquarters funding for a

- postdoc) 2002-04. Estimating boll weevil (*Anthonomus grandis*) long-range movement and gene flow using molecular markers. Sole PI.
- \$ 90,000 – ARS Special Grant. 2001-2003. Boll Weevil Survival in the Cotton Module and Gin. Sole PI
- \$ 35,000 – Texas Dept. of Agric. 2001-2002 Effects of various seed cotton handling and ginning practices on boll weevil survival. Co-PI with R. Baker (PI), ARS, Lubbock, TX.
- \$ 350,000 – NIH FIRST Grant. 1998-2003. The African malaria mosquito vitellogenin receptor. (Resigned grant when offered unrelated position with USDA-ARS). Sole PI.

PROFESSIONAL ACTIVITIES AND LEADERSHIP ROLES

Organized or Co-organized:

- Guest Editor (invited by Editors-in-Chief D. Denlinger and J. Harvey) for 2017 "Pests and Resistance" section of Vol. 21 of the journal *Current Opinion in Insect Science*. Recruited a Co-editor, and together we invited and handled submissions for 9 review articles on the theme, "Evolutionary Ecology of Insect Resistance".
- 26th IWGO Conference (International Working Group on *Ostrinia* and Other Maize Pests), Beijing, China, Apr 9-13, 2017. (12 Sessions, 60 speakers, poster session).
- Symposium: *Migratory Pests of Corn*. 26th IWGO Conference, Beijing, China, Apr 9-13, 2017.
- 25th IWGO Conference, Chicago, IL, Apr 13-17, 2014. (12 Sessions, 60 speakers, poster session). Host and local arrangements coordinator.
- 4th International Conference on *Diabrotica* Genetics, Chicago, USA, Apr 13-17, 2014.
- Symposium: *Population Genetics in the Service of Pest Management*, XXIVth International Congress of Entomology, Daegu, Korea, Aug 23, 2012.
- 3rd International Conference on *Diabrotica* Genetics, Freiberg, Germany, Oct 24-26, 2011.
- PI-E Section Symposium: *Reaching out across the bag-tag: Overcoming diversity of industry, university, and government interests to embrace public-sector research on commercialized transgenic crops*. Entomological Society of America Annual Meeting. San Diego, CA, Dec 12-15, 2010.
- ARS-Monsanto Research Agreements Workshop. St. Louis, MO, Dec 16-17, 2009.
- 2nd International Conference on *Diabrotica* Genetics, Munich, Germany, Apr 6, 2009.
- Symposium: *Toward a Synthesis: Recent Advances in Understanding Ostrinia Adult Behavior*. 23rd IWGO Conference (International Working Group on *Ostrinia* and Other Maize Pests), Munich, Germany, Apr 5-8, 2009.
- Western Corn Rootworm Genome Sequencing Workshop*. Entomological Society of America Annual Meeting. Reno, NV, Nov 18, 2008
- Symposium: *Corn Rootworm Genetics: Current Status, Goals for the Future, and Implications Toward Resistance Management*. Entomological Society of America Annual Meeting. San Diego, CA, Dec 9-12, 2007.
- Symposium: *The Role of Genetics in Fighting the Western Corn Rootworm*. 22nd IWGO Conference (International Working Group on *Ostrinia* and Other Maize Pests), Vienna, Austria, Nov 6-8, 2006.
- International Conference on *Diabrotica* Genetics, Kansas City, MO, Dec 13-15, 2004

Diabrotica Genetics Consortium (40+ scientists, 7 countries), 2003-Present.
 Session: "Research Area IV - Research on Resistance", Corn Rootworm Insect Resistance Management Workshop, Monsanto Co., St. Louis, MO, Dec 16, 2003.
 Invited moderator of session at Keystone Symposium on Molecular Biology: *Toward the Genetic Manipulation of Insects*, "Target Genes I: Reproduction and Development", Taos, New Mexico, Jan 12, 1998.

Panels, Boards, Technical Committees:

Recommender, *Peer Community in Evolutionary Biology*. Invited by organizers to be charter member of the Reviewing Board. www.peercommunityin.org June 2016 - Present.
 Syngenta Technical Advisory Board – Insect Control Review. 1 of 2 invited external experts to serve with 5 sitting Board members in reviewing ongoing and future (5-10 yr horizon) R&D activities related to insect control technologies. Stein, Switzerland – Oct 4-6, 2015.
 ICE 2016 (International Congress of Entomology) Scientific Subcommittee, Poster Co-Chair 2013-2016.
 IWGO (International Working Group on *Ostrinia* and Other Maize Pests), North American Co-Convenor – Nov 2011-Present.
 NCCC-46 Committee (*Development, Optimization and Delivery of Management Strategies for Corn Rootworms and Other Below-ground Insect Pests of Maize*), 2003-present.
 Officer, Feb 2011-Jan 2014.
 Chair, Feb 2013-Jan 2014.
 NC-205 Committee (*Ecology and Management of European Corn Borer and Other Lepidopteran Pests of Corn*), 2003-2015.
 Officer, Feb 2013-Jan 2020, Chair starting 2015; superseded by NC246 (see below).
 NC-246 Committee (*merged NCCC46+NC205*)(*Ecology and Management of Arthropods in Corn*)
 Chair Feb 2015- Jan 2016.
 NCERA-213 (formerly NCR-148) Committee (*Migration and Dispersal of Agriculturally Important Biota*), Oct 2002-Present.
 Officer, Oct 2004-Oct 2007.
 Chair, Oct 2006-Oct 2007.
 EPA Resistance Detection Workgroup (invited by EPA), 2013-present.
 Operations Committee for the NC205/NCCC46 Resistance Research and Outreach Coordination Project – Apr 2012-2015.
 ABSTC/NCCC46 Academic Communications subcommittee. (ABSTC = Agricultural Biotechnology Stewardship Technical Committee) – Mar 2012-2013.
 USDA-ARS, RPES (Research Position Evaluation System) panelist, 2008-present (5 regular panels + 1 ad hoc).
 Scientific Advisory Board, *Journal of Applied Entomology* – Invited by Editor-in-Chief, 2006-Present.
 Invited to serve in Expert Group on Western Corn Rootworm Ecology to identify research needs and draft a coordinated European research plan, EU Programme FP6-2004-SSP-4, "Harmonise the strategies for fighting *Diabrotica virgifera virgifera*", 2006-2008.
 EPA FIFRA Scientific Advisory Panel No. 2006-03, *Analysis of a Natural Refuge of Non-Cotton Hosts for Monsanto's Bollgard II Cotton*, Panel Member and Final Report Coordinator, Jun-Sep 2006.

USDA-CSREES, National Research Initiative grant proposal review panel, Apr 2006.
 ARS, National Programs 304 (Crop Protection and Quarantine) and 305 Crop Production Planning Workshop to set national priorities. Invited participant, session recorder, and lead author for problem area "Population Studies/Ecology" for NP304 5-yr Action Plan, Oct-Dec 2000.

Entomological Society of America (ESA):

Student Poster Competition Judge, 2017, 2018 Annual Meeting of the ESA
 Poster Co-Chair, 2016 Annual Meeting of the ESA and XXVth International Congress of Entomology, Orlando, FL

Program Committee Co-Chair, 2015 Annual Meeting of the ESA, Minneapolis, MN

Student Competition Co-Chair, 2014 Annual Meeting of the ESA, Portland, OR

Publications Council, Chair, 2009.

Publications Council Representative, Plant-Insect Ecosystems Section – 2008-2009.

Publications Council Representative, Section C – 2007.

Environmental Entomology

Subject Editor, *Molecular Ecology & Evolution* section – Apr 2002-Feb 2016.

Subject Editor, *Transgenic Plants & Insects* section – Mar 2005-2008.

Subject Editor, *Physiological Ecology* section – Apr 2002-Mar 2005.

Co-Editor – Feb 2001-Apr 2002

Journal of Medical Entomology

Chair, Editorial Board – 2004; Acting Chair at annual meeting – 2009

Editorial Board, Plant-Insect Ecosystems Section Rep, 2008-2009

Editorial Board, Section C Rep, 2000-2007 (elected twice)

Linnean Games, judge, 2007

Southwestern Branch ESA:

Awards Committee (1999-2002)

Linnean Games Committee (1999-2002)

Society Memberships:

Entomological Society of America

Society for the Study of Evolution

American Association for the Advancement of Science

Sigma Xi, The Scientific Research Society

Other:

Graduate Faculty, Iowa State University, Ames, IA, Jan 2004-Present.

Sigma Xi ISU Chapter, Liaison to Entomology Department. 2016-Present.

Sigma Xi ISU Chapter, Membership Committee. 2016-Present.

Executive Steering Committee, Osborn Research Club, Iowa State Univ., 2015-2017;

Chair, 2016

Sabbatical host for senior entomologist from the Chinese Academy of Agricultural Science specializing in migration of insect pests of agriculture, Sep 2009-Aug 2010.

Interim Principal Editor, *Crop Protection*, Elsevier, Jul 2009-Jan 2010.

Chair, USDA-ARS, KSARC Distinguished Scientist Seminar Committee, 2002.

Graduate Faculty, adjunct, University of Texas-Pan American, 2000-2002.
 Interim Editor, Rapid Communications (section for especially high impact studies), *Insect Biochemistry and Molecular Biology*, Sep 1996-Jan 1997.

Provided one or more *ad hoc* peer-reviews for the following journals:

<i>Afr. Entomol.</i>	<i>Ecotoxicol. Environ. Safety</i>	<i>J. Kans. Entomol. Soc.</i>
<i>Agr. For. Entomol.</i>	<i>Entomol. Exp. Appl.</i>	<i>J. Med. Entomol.</i>
<i>Agronomy</i>	<i>Entomol. News</i>	<i>J. Molecular Evolution</i>
<i>Agron. J.</i>	<i>Entomol. Sci.</i>	<i>J. Pest Science</i>
<i>American Entomologist</i>	<i>Environ. Entomology</i>	<i>Marina Mesopotamica</i>
<i>Ann. Appl. Biol.</i>	<i>Eur. J. Entomology</i>	<i>Microscopy Res. Technique</i>
<i>Ann. Entomol. Soc. Amer.</i>	<i>Evolutionary Applications</i>	<i>Molecular Biology Reports</i>
<i>Appl. Engineering Agric.</i>	<i>Field Crops Research</i>	<i>Molecular Ecology</i>
<i>Arch. Insect Biochem. Physiol.</i>	<i>Florida Entomologist</i>	<i>Molecular Ecology Resources</i>
<i>Behav. Ecol. Sociobiol.</i>	<i>Gene</i>	<i>Nature Biotechnology</i>
<i>Biochem. Genet.</i>	<i>Genetica</i>	<i>North-Western J. Zoology</i>
<i>Biocontrol</i>	<i>GM Crops</i>	<i>New Zeal. J. Crop Hort. Sci.</i>
<i>BioEnergy Res.</i>	<i>Heredity</i>	<i>PCI Evolutionary Biology</i>
<i>Biological J. Linnean Soc.</i>	<i>Insect Biochem. Mol. Biol.</i>	<i>Pesticide Biochem. Physiol.</i>
<i>Bioresource Technol.</i>	<i>Insect Molecular Biology</i>	<i>Pest Management Science</i>
<i>BMC Ecology</i>	<i>Insect Science</i>	<i>Philippine Agr. Scientist</i>
<i>BMC Evol. Biol.</i>	<i>Intl. J. Biometeorology</i>	<i>Physiological Entomology</i>
<i>BMC Genetics</i>	<i>Intl. J. Pest Management</i>	<i>Proc. Natl. Acad. Sci. USA</i>
<i>BMC Genomics</i>	<i>J. Appl. Entomology</i>	<i>Proc. R. Soc. B: Biol. Sci.</i>
<i>Bull. Entomol. Res.</i>	<i>J. Asia-Pacific Entomology</i>	<i>Remote Sens. Appl. Env. Soc.</i>
<i>Can. Entomol.</i>	<i>J. Chemical Ecology</i>	<i>Revista Brasil. Entomologia</i>
<i>Cell Tiss. Res.</i>	<i>J. Cotton Science</i>	<i>Scientific Reports</i>
<i>Crop Protection</i>	<i>J. Economic Entomology</i>	<i>Theor. Appl. Genetics</i>
<i>Ecography</i>	<i>J. Insect Behavior</i>	<i>Tissue and Cell</i>
<i>Ecol. Entomol.</i>	<i>J. Insect Physiology</i>	<i>Trans. Am. Soc. Agr. Biol. Eng.</i>
<i>Ecotoxicology</i>	<i>J. Insect Science</i>	

Provided one or more *ad hoc* peer-reviews of competitive grant proposals submitted to the following organizations (2005-2016):

US:

USDA-CSREES (NRI)
 USDA-CSREES (BRAG)
 USDA-NIFA (SBIR)
 USDA-ARS, Areawide IPM Project
 NSF (Gene Expression Panel in Molecular & Cellular Biosciences)
 NSF (Animal Behavior Panel)
 NSF (Plant Biotic Interactions, joint program with USDA-NIFA)
 Sigma Delta Epsilon/Graduate Women in Science Fellowship
 Consortium for Plant Biotechnology Research
 Iowa State University Richardson Research Incentive Grants

International:

Austrian Science Fund (FWF)
 British Council (UK-Indian Research Scheme)
 Biotechnology and Biological Sciences Research Council (BBSRC), UK
 Estonian Science Foundation
 Hungarian OKTA
 National Science Centre, Poland
 Swiss Federal Institute of Technology (ETH)
 Swiss National Science Foundation

INVITED SEMINARS, WEBINARS, SYMPOSIA, LECTURES, & WORKSHOPS

(* = International)

Ghost riders in the sky: "Invisible" migration of insect pests within a year-round distribution.

NC-246, invited special topics presentation, Cleveland, OH, Jan. 22-24, 2019.

Minor and sporadic early-season pests of corn and soybean: Predicting risk of infestation in individual fields. Plenary presentation, Early Season Pest IPM Workshop, Ames, IA, June 19, 2018.

Insights into WCR dispersal distances based on genetic markers: The long and short of it.

Monsanto Corn Academic Summit, St. Charles, MO, Feb. 20, 2018.

*Using population genetics to answer critical questions about pest dispersal. Institute of Plant Protection, Chinese Academy of Agricultural Science. Beijing, China, Apr. 15, 2017.

*Estimating gene flow to understand dispersal of insect pests of crops. Northwestern A&F University, Yangling, China, Apr. 14, 2017

*Evidence for migratory flight behavior of western corn rootworm. 26th IWGO Conference (International Working Group on *Ostrinia* and Other Maize Pests), Beijing, China, Apr. 11, 2017.

*How to weed out wannabes and evolve the perfect pest: The critical influence of insect dispersal in agroecosystems. Symposium: *Rapid evolution of insect pests within agroecosystems*. Genetics and Evolutionary Ecology section, XXV International Congress of Entomology, Orlando, FL, Sep. 26, 2016.

Pest outbreaks as an emergent property of managing density-dependent risks and rewards

through facultative migratory decisions. P-IE Section Symposium: *Ecology and management of migratory moth pests: Uniting disciplines to provide solutions*.

Entomological Society of America Annual Meeting. Minneapolis, MN, Nov. 17, 2015.

How to pick an especially large elephant in the room and ask it a few pertinent questions:

Pressing issues in insect movement ecology. Dept. of Entomology, University of Nebraska-Lincoln, Aug. 24, 2015.

*Characterizing *Diabrotica* dispersal in the context of resistance to Bt corn. Department of Entomology, Nanjing Agricultural University, Nanjing, China, Dec. 20, 2014.

*Progress in characterizing western corn rootworm long-distance dispersal. Institute of Plant Protection, Chinese Academy of Agricultural Science. Beijing, China, Dec. 18, 2014.

*Open discussion: Moving forward with *Diabrotica* -omics research. Joint Open Session, Corn Insect Technical Committees and 25th IWGO Conference (International Working Group on

- Ostrinia* and Other Maize Pests), Chicago, IL, Apr. 17, 2014.
- Sifting for secrets and looking for leverage: Advances in genetics/genomics research on western corn rootworm. Symposium: *Advances and Challenges in Management of Western Corn Rootworm*. North Central Branch, ESA, Des Moines, IA, Mar. 12, 2014.
- Entomology jobs in ARS. Student Lunch, North Central Branch, ESA, Des Moines, IA, Mar. 10, 2014.
- Public/Industry blanket research agreements on commercialized transgenic crops: 'You can't always get what you want', but we just might find we'll get what we need.... Dow AgroSciences, R&D Seminar Series, Indianapolis, IN, Jan. 20, 2014.
- How to write a good scientific paper. ESA Webinar Series, delivered live to 396 registered viewers, archived recording at <http://www.entsoc.org/students/esa-webinar-series>. May 21, 2013.
- Where'd everybody go? The importance and complexities of achieving a holistic understanding of dispersal in insect pests. Center for Plant Responses to Environmental Stresses, Iowa State University, Nov. 9, 2012.
- Insights into western corn rootworm long-distance dispersal using population genetics. Monsanto Corn Academic Summit, St. Louis, MO, Oct. 4, 2012.
- *Challenges in clarifying population structure in invasive and highly dispersive species. College of Veterinary Medicine, Seoul National University, South Korea, Aug. 30, 2012. [cancelled for health reasons]
- *Insights into insect dispersal through population genetics: Implications for insect resistance management and eradication. Department of Agricultural Biotechnology, Seoul National University, South Korea, Aug. 28, 2012. [cancelled for health reasons]
- *Gene flow and neighborhood area in European corn borer (Lepidoptera: Crambidae) in the U.S., and implications for insect resistance management. XXIV International Congress of Entomology, Daegu, South Korea, Aug. 19-24, 2012. [cancelled trip for health reasons, talk delivered by collaborator, K.S. Kim]
- *Population genetics studies of invasive insects: Challenges with two key corn pests in North America. Institute of Vegetable Research Center, Hubei Academy of Agricultural Science. Wuhan, China, April 16, 2012.
- *Writing high impact science papers for Western journals. Full-day workshop for graduate students, Institute of Plant Protection, Chinese Academy of Agricultural Science. Beijing, China, April 13, 2012.
- *Measuring gene flow in the invasive European corn borer and western corn rootworm: Challenges and progress. Institute of Plant Protection, Chinese Academy of Agricultural Science. Beijing, China, April 11, 2012.
- A tough nut to crack: Gaining insights into the mysteries of insect dispersal through population genetics. Dept. of Entomology, Pennsylvania State University, Nov. 4, 2011.
- *Population genetic structure of western corn rootworm in its (almost) original home range in Colorado and Kansas. Symposium: *Exploring gene flow in Diabrotica across space, time, and species*. 3rd International Conference on *Diabrotica* Genetics (part of 24th IWGO Conference), Freiburg, Germany, Oct 24-26, 2011.
- Genetics and genomics of western corn rootworm: What we're trying to do, where we hope to get to, and why it matters. Symposium: *Diabrotica Populations & Control Tactics: A continuum or rapidly changing situation?* North Central Branch, ESA, Minneapolis, MN, Mar. 13-16, 2011.

- E-race European corn borer: Invasion history, host use, and gene flow. NC-205, invited special topics presentation, Columbus, OH, Jan. 27, 2011.
- Synchronized rotation of Bt and non-Bt corn: A prospective ARS Area-wide Project to capitalize on regional pest suppression. NCCC-46/NC-205 Joint Session, Columbus, OH, Jan. 26, 2011.
- We gotta get out of this place...: The nature of the swamp we're in and cooperative efforts to find the high road up and out.* Symposium: *Reaching out across the bag-tag: Overcoming diversity of industry, university, and government interests to embrace public-sector research on commercialized transgenic crops.* Entomological Society of America Annual Meeting. San Diego, CA, Dec. 14, 2010.
- Understanding corn insect pests and how to manage them without Bt corn. U.S. Testing Network Field Day, Practical Farmers of Iowa. Ames, IA, Sep 23, 2010.
- Ride hard and keep your head low: Adventures in problem solving through multidisciplinary research. Dept. of Entomology, Texas A&M University, Mar. 30, 2010.
- *The *Diabrotica* Genetics Consortium, sequencing the rootworm genome, and creating WCRbase. Information Systems for Insect Pests, 1st International Workshop, Rennes, France, Nov. 16, 2009.
- *Genomics resources for western corn rootworm and prospects for a genome sequencing project. Symposium: *Diabrotica genomics: Advances and prospects.* 2nd International Conference on *Diabrotica* Genetics (part of 23rd IWGO Conference), Munich, Germany, Apr. 7, 2009.
- *ECB dispersal at small and large scales: New insights, maddening mysteries, and the elusive unified theory of everything. Symposium: *Toward a Synthesis: Recent Advances in Understanding Ostrinia Adult Behavior.* 23rd IWGO Conference (International Working Group on *Ostrinia* and Other Maize Pests), Munich, Germany, Apr. 6, 2009.
- Molecular ecology of insect invasions: Why we care and why it is so challenging. Symposium: *Plant-Insect Interactions and Molecular Ecology.* National Research Initiative, Arthropods & Nematodes Biology & Management Programs Awardee Workshop (FY 2009). Reno, NV, Nov. 16, 2008.
- *Long-distance gene flow among European corn borer populations in North America. Symposium: *Genetics, Pesticides, and Bt resistance.* XXIII International Congress of Entomology, Durban, South Africa, July 11, 2008.
- *Transatlantic cooperation on *Diabrotica* genetics research: Lessons from the past, present activities and future opportunities. *Keynote Address: DIABR-ACT, closing EU project meeting: The Western Corn Rootworm: Research and Long Term Management Needs for European Maize Production.* Göttingen, Germany, May 26, 2008. [*Schedule conflict, so presented by postdoc Nick Miller*]
- *The importance of understanding dispersal of agricultural insect pests: Applications in IRM and eradication contexts. Institute of Insect Sciences, Zhejiang University. Hangzhou, China, April 18, 2008.
- *Characterizing dispersal of agricultural insect pests: Integrating ecological, behavioral, and genetics approaches. Institute of Plant Protection, Chinese Academy of Agricultural Science. Beijing, China, April 17, 2008.
- Using molecular markers to characterize insect movement over large spatial scales. Symposium: *From the Small to the Grand Scale: Innovations in Studies on Insect Dispersal.* Entomological Society of America Annual Meeting. San Diego, CA, Dec. 9-12, 2007.
- Genetic markers for corn rootworms: strategies, uses, and progress. Symposium: *Corn*

- Rootworm Genetics: Current Status, Goals for the Future, and Implications Toward Resistance Management.* Entomological Society of America Annual Meeting. San Diego, CA, Dec. 9-12, 2007.
- Ghost riders in the sky: Understanding insect dispersal by flight (and why we care). Osborn Research Club, Iowa State University, Ames, IA, Nov. 12, 2007.
- *History and dynamics of range expansion of WCR in North America and Europe. International Workshop on WCR Ecology, (Sixth Framework Programme, Specific Support Action; DIABR-ACT Project: Harmonise the strategies for fighting *Diabrotica virgifera virgifera*), INRA, Nice, France, March 21, 2007.
- *Diapause in the western corn rootworm: ecology, physiology, and genetics. International Workshop on WCR Ecology, (Sixth Framework Programme, Specific Support Action; DIABR-ACT Project: Harmonise the strategies for fighting *Diabrotica virgifera virgifera*), INRA, Nice, France, March 20, 2007.
- European corn borer dispersal and IRM for Bt corn. Symposium: *Bt Crop Sustainability*. Entomological Society of America Annual Meeting. Indianapolis, IN, Dec. 10-13, 2006.
- *Factors affecting spatial distribution of European corn borer adults across the landscape. Symposium: *Maize Insect Management with Genetically-Engineered Maize: Lessons Learned*. International Working Group on *Ostrinia* and Other Maize Pests (IWGO), Vienna, Austria, Nov. 6-8, 2006.
- *Genetic diversity in wild populations and laboratory colonies of western corn rootworm in the US. Symposium: *The Role of Genetics in Fighting the Western Corn Rootworm*. International Working Group on *Ostrinia* and Other Maize Pests (IWGO), Vienna, Austria, Nov. 6-8, 2006.
- Using yield monitor data to locate European corn borer damage in Bt/nonBt strip-planted cornfields. Symposium: *Advances in Bt Crop Stewardship Management*. North Central Branch of the Entomological Society of America, Bloomington, IL, Mar. 27, 2006.
- Using DNA markers to determine likely origins of boll weevil reintroductions. Boll Weevil Action Committee's Sub-Committee on Post Eradication Transition, Little Rock, AR, Nov. 21, 2005.
- Characterizing dispersal distances and population boundaries of invasive insect pests using molecular markers. Dept. of Entomology, University of Missouri, Columbia, MO, Dec. 3, 2004.
- Toward prescription planting of Bt corn: Using yield monitor data from Bt strip-planted cornfields to map chronic European corn borer damage hot-spots. Symposium: *New Frontiers in Pest Management: Theory and Practice*. 2004 Entomological Society of America Annual Meeting. Salt Lake City, UT, Nov. 15, 2004.
- *The *Diabrotica* Genetics Consortium: A paradigm for global cooperation in research. Symposium: *Genetics, Pesticides, and Bt resistance*. XXII International Congress of Entomology, Brisbane, Australia, Aug. 18, 2004.
- Boll weevil survival through the cotton gin. Special talk and demonstration to a high-ranking fact-finding delegation of scientists and government officials from Egypt. Invitation from National Cotton Council. Cotton Production and Processing Research Laboratory, Lubbock, TX, July 23, 2004.
- Applications of chemistry in entomology. Symposium: *Applications of Chemistry in Agriculture: Opportunities and Challenges*. 18th Biennial Conference on Chemical Education, Iowa State University, Ames, IA, July 21, 2004.

- Introducing the *Diabrotica* Genetics Consortium. Session on *Diabrotica* Genetics Consortium, NCR-46 and NC-205 Joint Meeting, Columbus, Ohio, Jan. 27, 2004.
- Development of microsatellite markers for western corn rootworm. Session: "Research Area IV - Research on Resistance," Corn Rootworm Insect Resistance Management Workshop, conducted by Monsanto Company, St. Louis, MO, Dec. 16, 2003.
- The *Diabrotica* Genetics Consortium: Where it came from, what it is, & where we're going. Session: "Research Area IV - Research on Resistance," Corn Rootworm Insect Resistance Management Workshop, conducted by Monsanto Company, St. Louis, MO, Dec. 16, 2003.
- Research windows into the weird and wonderful world of adult European corn borer behavior and ecology. Department of Entomology, North Dakota State University, Fargo, ND, Nov. 13, 2003.
- Boll weevil dispersal and the threat to eradication efforts. Section F Symposium: *Importance of Migration and Dispersal for Integrated Pest Management*. 2003 Entomological Society of America Annual Meeting. Cincinnati, OH, Oct. 29, 2003.
- "Why study boll weevils if they are being eradicated?" Boll weevil ecology research in support of pre-, active, and post-eradication programs. USDA-ARS, CICGRU, Ames, IA, Sep. 26, 2002.
- Boll weevil survival in the cotton gin, and the chances of live weevils being collected in the seed fraction. Arkansas Boll Weevil Technical Advisory Committee, Little Rock, AR, June 24, 2002.
- Transport of boll weevils on cotton modules, and potential for survival in the gin. Special presentation to high-ranking Pakistani fact-finding delegation regarding cotton import quarantine issues. Cropping Systems Research Laboratory, Lubbock, TX, May 22, 2002.
- Boll weevil survival in gins and the bale press, and potential for transport. Entomology Science Conference, College Station, Texas, Oct. 31, 2001.
- The importance of movement in insect population ecology. 2.5-hour lecture to students in two Entomology courses (Biology 4415 and 5315), Department of Biology, University of Texas-Pan American, March 21, 2001.
- Survival of boll weevils passing through cotton gins. Entomology Science Conference, College Station, Texas, Nov. 1, 2000. (Declined due to schedule conflict.)
- Mutual interference of boll weevil pheromone traps. Entomology Science Conference, College Station, Texas, Nov. 1, 2000. (Declined due to schedule conflict.)
- Use of mortality screens to sample dead boll weevils. Entomology Science Conference, College Station, Texas, Nov. 1, 2000. (Declined due to schedule conflict.)
- Ginning effects on boll weevils. Texas Boll Weevil Eradication Foundation Technical Advisory Committee, Abilene, Texas, Oct. 19, 2000
- Attraction of boll weevils to fall trap crops. Entomology Science Conference, College Station, Texas, Nov. 10, 1999.
- Effects of wind on boll weevil pheromone trap captures. Entomology Science Conference, College Station, Texas, Nov. 10, 1999.
- *Mosquito yolk proteins. VIth European Congress of Entomology: *Insect Blood Proteins*, Institute of Entomology of the Czech Academy of Sciences, Czech Republic, August 23, 1998. (Declined due to schedule conflict)
- Mosquito vitellogenin and vitellogenin receptor: Key players in oocyte development. Department of Biology, University of Alabama-Birmingham, Feb. 10, 1998.
- Molecular analysis of insect vitellogenins and the mosquito vitellogenin receptor. Keystone

- Symposium on Molecular Biology: *Toward the Genetic Manipulation of Insects*, "Target Genes I: Reproduction and Development", Taos, New Mexico, Jan. 12, 1998.
- An embarrassment of riches: Aligning repetitive modular elements of LDL receptor family proteins after exon shuffling, duplications, and deletions. Structural Techniques Group, Dept. of Biochemistry, Michigan State University, June 13, 1997.
- *Biosynthesis and endocytosis of mosquito vitellogenin: cloning of pro-vitellogenin cleavage convertase and vitellogenin receptor cDNAs. Symposium on *Vitellogenesis: Molecular and Biochemical Aspects*, XXth International Congress of Entomology, Florence, Italy, Aug. 30, 1996.
- Population genetics of hybrid zones and the maintenance of gene pool integrity. Department of Entomology, University of Massachusetts, Jan. 19, 1996.
- The mosquito vitellogenin receptor: Structural and functional paradigm, evolutionary paradox. Department of Entomology, University of Massachusetts, Jan. 18, 1996.
- Factors influencing migratory behavior of the noctuid moth, *Agrotis ipsilon*. Department of Biology, Central Missouri State University, November 14, 1991.
- Disruptive sexual selection on courtship pheromone in sulfur butterflies. Department of Entomology, University of Illinois, April 8, 1991.
- Migratory behavior of the black cutworm moth (*Agrotis ipsilon*; Noctuidae) in North America. Department of Entomology, Clemson University, March 4, 1991.
- Long-duration flight behavior of the migratory noctuid, *Agrotis ipsilon* (Lepidoptera). Department of Systematics & Ecology, University of Kansas, February 14, 1991.

INVITED LOCAL DEPARTMENT & UNIT SEMINARS

- Science beyond the mutual blank-stare phase: Adventures in multidisciplinary research and leadership. USDA-ARS, Ames, IA, April 2009.
- How to land a job with USDA-Agricultural Research Service. Brown Bag Lunch Series, Department of Entomology, Iowa State University, February 2008.
- Understanding dispersal behavior of invasive insect pests through experimentation and genetic inference. Department of Entomology, Iowa State University, September 2006.
- Glimpses into the curious world of adult European corn borer behavior and ecology. Department of Entomology, Iowa State University, November 2003.
- Molecular and biochemical characterization of the mosquito vitellogenin receptor: Paradigm or paradox? Department of Entomology, Michigan State University, April 1996.
- "Just can't stop that feelin' . . .": Sources of variation in individual migratory behavior of black cutworm moths. Department of Entomology, Iowa State University, January 1991.
- Pheromone variation, female dimorphism, and disruptive sexual selection in *Colias eurytheme* (Pieridae) butterflies. Department of Entomology, Iowa State University, March 1989.
- Pheromone variation and disruptive sexual selection in *Colias eurytheme* (Pieridae) butterflies. Department of Systematics and Ecology, University of Kansas, February 1989.
- Heritability of courtship pheromone components in *Colias* butterflies. Department of Entomology, University of Kansas, March 1986.
- Comparison of three sampling methods for monitoring adult European corn borer (*Ostrinia nubilalis*; Pyralidae) population trends and activity. Department of Entomology, Iowa State University, April 1982.

Evolutionary filling of ecological niches, as illustrated by insects. Department of Entomology, Iowa State University, March 1981.

SUBMITTED PRESENTATIONS AT CONFERENCES AND MEETINGS

(excluding co-authorships with presenting students, postdocs, and others)

Ghost riders in the sky: "invisible" migration of insect pests within a year-round distribution.

[Invited poster: P-IE Section Symposium: Monitoring and Managing Agricultural Insects Crossing Borders] Annual Meeting of the Entomological Society of America, Vancouver, BC, Nov. 11-14, 2018.

Genetic evidence for bimodal dispersal behavior in populations of western corn rootworm (Insecta: Chrysomelidae). [Invited poster] Gordon Research Conference, *Movement Ecology of Animals*, Ventura, CA, March 19-24, 2017.

Estimating western corn rootworm gene flow. Annual Meeting of the Entomological Society of America, Portland, OR, Nov. 16-19, 2014.

Evidence from early accounts for reconstructing the mysterious origins of the bivoltine Z race of European corn borer in North America. 25th IWGO Conference (International Working Group on *Ostrinia* and Other Maize Pests), Chicago, Illinois, Apr. 14-17, 2014.

And then, 'some change took place...': The mysterious origins of the bivoltine Z-pheromone race of European corn borer in North America. Annual Meeting of the Entomological Society of America, Austin, TX, Nov. 10-14, 2013.

What do we know (and not know) about WCR dispersal? Special Joint Meeting of NCCC46 and NC205, Minneapolis, MN, Mar 12-13, 2013

Neighborhood size of European corn borer, and net dispersal distance from the natal field. Annual Meeting of the Entomological Society of America, Reno, NV, Nov. 13-16, 2011.

High gene flow and long-distance dispersal of European corn borer (Lepidoptera: Crambidae). Annual Meeting of the Entomological Society of America, Indianapolis, IN, Dec. 15, 2009.

Dynamics of the western corn rootworm range expansion through North America: Lessons for Europe and for spread of resistance. Annual Meeting of the Entomological Society of America, Reno, NV, Nov. 19, 2008.

Mapping European corn borer damage using yield monitor data in Bt/nonBt strip-planted corn. Annual Meeting of the Entomological Society of America, Ft. Lauderdale, FL, Dec. 17, 2005.

Population genetics of western corn rootworm based on microsatellite markers. Report to the NCR-148 Committee, Tuscon, AZ, Oct. 18, 2004.

First-generation European corn borer damage distribution within cornfields and its relationship to moth distribution in grass. North Central Branch – Entomological Society of America, Kansas City, MO, March 29, 2004.

Landscape effects on European corn borer adult distribution. Report to the NC-205 Committee, Columbus, OH, Jan. 26, 2004.

Modules, gins, and the threat of boll weevil introductions: what we know so far. Beltwide Cotton Conferences, Nashville, TN, Jan. 9, 2003.

Boll weevil short- and long-range dispersal studies. Report to the NCR-148 Committee, Kansas City, MO, Oct. 30, 2002.

Dispersal of boll weevils after exposure to defoliants and insecticides. Beltwide Cotton

- Conferences, Atlanta, GA, Jan. 11, 2002.
- Potential for boll weevil transport to gins on modules. Beltwide Cotton Conferences, Atlanta, GA, Jan. 10, 2002.
- Pheromone trap spacing affects boll weevil capture patterns depending on wind speed and direction. Annual Meeting of the Entomological Society of America, San Diego, CA, Dec. 9, 2001.
- Effects of defoliants alone and in combination with insecticides on boll weevil and whitefly in cotton: E. Boll weevil dispersal behavior. Beltwide Cotton Conferences, Anaheim, CA, Jan. 13, 2001.
- Effects of defoliants alone and in combination with insecticides on boll weevil and whitefly in cotton: B. Boll weevil flight behavior. Beltwide Cotton Conferences, Anaheim, CA, Jan. 13, 2001.
- Effects of age, sex, sexual development, and diet on boll weevil flight behavior. Joint Annual Meeting of the Entomological Society of America, Entomological Society of Canada, and Societe d'entomologie du Quebec, Montreal, Canada, Dec. 5, 2000.
- Interplay of vegetational features and microclimate on boll weevil capture in pheromone traps. XXI International Congress of Entomology, Iguassu Falls, Brazil, August 2000.
- Efficacy of the organically acceptable insecticide Diatect II against boll weevil. Conservation Tillage Field Day, USDA-ARS, Kika de la Garza Subtropical Agricultural Research Center, Weslaco, TX, April 26, 2000.
- Attracting late season boll weevils to late-planted cotton trap-rows. Southwestern Branch -- Entomological Society of America, Fort Worth, TX. February 8-11, 2000.
- Determining boll weevil age with cuticular hydrocarbon profiles. Beltwide Cotton Conferences, San Antonio, TX, January 8, 2000
- Beet armyworm fecundity and oviposition behavior. Beltwide Cotton Conferences, San Antonio, TX, January 7, 2000
- Utility of immunomarkers in mark-recapture experiments with boll weevil. Annual Meeting of the Entomological Society of America. Atlanta, GA, Dec. 1999.
- Effects of leeward or windward placement of pheromone traps along brush lines on captures of boll weevils. Conservation Tillage Field Day, USDA-ARS, Kika de la Garza Subtropical Agricultural Research Center, Weslaco, TX, April 4, 1999.
- Effects of trap placement within trap-lines and relative to brush-lines on boll weevil capture. Southwestern Branch -- Entomological Society of America, Las Cruces, NM. February 23-26, 1999.
- Molecular characterization of the mosquito vitellogenin receptor. Annual Meeting of the Entomological Society of America. Las Vegas, NV, December 1995.
- Mosquito vitellogenin receptor: Purification and developmental, biochemical, and molecular characterization. Keystone Symposium on Molecular Biology: *Toward the Genetic Manipulation of Insects*. Tamarron, CO, March 1995.
- Mosquito vitellogenin receptor: Biochemical, developmental, and molecular characterization. Annual Meeting of the Entomological Society of America. Dallas, TX, December 1994.
- Morphological correlates of migratory behavior for the Black cutworm moth. Annual Meeting of the North Central Branch of the Entomological Society of America. Kansas City, MO, March 1992.
- Lipid mobilization in black cutworm moths during forced-flight of long- and short-flyers. Annual Meeting of the Entomological Society of America. Reno, NV, December 1991.

- Patterns of lipid and carbohydrate utilization in *Agrotis ipsilon* during forced flight of long- and short-fliers. Report to the NCR-148 Committee, Salt Lake City, UT, September 1991.
- Density-induced phase variation in morphology, development, and behavior of *Agrotis ipsilon* (Noctuidae). Annual Meeting of the North Central Branch of the Entomological Society of America. Milwaukee, WI, March 1991.
- Developmental sources of variation in migratory behavior of black cutworm (*Agrotis ipsilon*). Annual Meeting of the Entomological Society of America, New Orleans, LA, December 1990.
- Developmental sources of variation in long-duration flight behavior of *Agrotis ipsilon*. Report to the NCR-148 Committee, Ames, IA, November 1990.
- Pheromone variation, female dimorphism, and disruptive sexual selection in *Colias eurytheme* (Pieridae). Annual Meeting of the Entomological Society of America, San Antonio, TX, December 1989.
- Density-induced phase variation in *Agrotis ipsilon* morphology, larval activity, and adult flight activity. Report to the NCR-148 Committee, St. Louis, MO, November 1989.
- Pheromone variation and disruptive sexual selection in *Colias eurytheme* (Pieridae) butterflies. Annual Meeting of the North Central Branch of the Entomological Society of America, Indianapolis, IN, March 1989.
- Intraspecific variation in male courtship pheromone and female mate selection in *Colias eurytheme* (Lepidoptera: Pieridae). Annual Meeting of the Entomological Society of America, Boston, MA, December 1987.
- Comparison of three sampling methods for assessing adult European corn borer (*Ostrinia nubilalis*) population trends and activity in the field. Annual Meeting of the North Central Branch of the Entomological Society of America, Sioux Falls, SD, March 1982.
- Sampling adult European corn borer to monitor larval populations. Report to the NC-105 Committee, Columbus, OH, March 1981.
- Sampling methods to determine nightly flight activity of European corn borer adults. Annual Meeting of the North Central Branch of the Entomological Society of America, Columbus, OH, March 1981.

PUBLICATIONS**Peer-Reviewed Journals** (Author in *italics* indicates postdoc, student, or visiting scientist concurrently mentored by TWS)

- Sappington, T. W.** 2018. Migratory flight of insect pests within a year-round distribution: European corn borer as a case study. *J. Integr. Agric.* 17: 1485-1505.
- Allen, K. C., R. G. Luttrell, **T. W. Sappington**, L. S. Hesler, and S. K. Papiernik. 2018. Frequency and abundance of selected early-season insect pests of cotton. *J. Integr. Pest Manag.* 9(1): 20. doi: 10.1093/jipm/pmy010
- Hesler, L. S., K. C. Allen, R. G. Luttrell, **T. W. Sappington** and S. K. Papiernik. 2018. Early-season pests of soybean in the United States and factors that affect their risk of infestation. *J. Integr. Pest Manag.* 9(1): 19. doi: 10.1093/jipm/pmx028
- Papiernik, S. K., **T. W. Sappington**, R. G. Luttrell, L. S. Hesler, and K. C. Allen. 2018. Overview: Risk factors and historic levels of pressure from insect pests of seedling corn, cotton, soybean, and wheat in the U.S. *J. Integr. Pest Manag.* 9(1): 18. doi: 10.1093/jipm/pmx026
- Hesler, L. S., **T. W. Sappington**, R. G. Luttrell, K. C. Allen, and S. K. Papiernik. 2018. Selected early-season insect pests of wheat in the United States and factors affecting their risks of infestation. *J. Integr. Pest Manag.* 9(1): 17. doi: 10.1093/jipm/pmx023
- Sappington, T. W.**, L. S. Hesler, K. C. Allen, R. G. Luttrell, and S. K. Papiernik. 2018. Prevalence of sporadic insect pests of seedling corn, and factors affecting risk of infestation. *J. Integr. Pest Manag.* 9: 16. doi: 10.1093/jipm/pmx020
- Rovnyak, A. M., C. S. Burks, A. J. Gassmann, and **T. W. Sappington**. 2018. Interrelation of mating, flight, and fecundity in navel orangeworm females. *Entomologia Experimentalis et Applicata* 166: 304-315. (doi: 10.1111/eea.12675)
- Qin, J., Y. Liu, L. Zhang, Y. Cheng, **T. W. Sappington**, and X. Jiang. 2018. Effects of moth age and rearing temperature on the flight performance of the loyeyi leafworm, *Mythimna loyeyi* (Lepidoptera: Noctuidae), in tethered and free flight. *J. Econ. Entomol.* 111: 1243-1248.
- Coates, B. S., E. B. Dopman, K. W. Wanner, and **T. W. Sappington**. 2018. Genomic mechanisms of sympatric ecological and sexual divergence in a model agricultural pest, the European corn borer. *Curr. Opin. Insect Sci.* 26: 50-56.
- Lombaert, E., M. Ciosi, N. J. Miller, **T. W. Sappington**, A. Blin, and T. Guillemaud. 2018. Colonization history of the western corn rootworm (*Diabrotica virgifera virgifera*) in North America: insights from random forest ABC using microsatellite data. *Biological Invasions* 20: 665-677. doi:10.1007/s10530-017-1566-2
- Miller, N. J., and **T. W. Sappington**. 2017. Role of dispersal in resistance evolution and spread. *Curr. Opin. Insect Sci.* 21: 68-74.
- Qin, J., X. Jiang, L. Zhang, **T. W. Sappington**, Y. Cheng, and L. Luo. 2017. Population projection and development of the *Mythimna loyeyi* as affected by temperature: application of an age-stage, two-sex life table. *J. Econ. Entomol.* 110: 1583-1591.
- Liu, S., Y. Chen, **T. W. Sappington**, and B. C. Bonning. 2017. Genome sequence of a novel positive sense, single-stranded RNA virus isolated from western corn rootworm, *Diabrotica virgifera virgifera* LeConte. *Genome Announc.* 5(20):e00366-17. doi: 10.1128/genomeA.00366-17.
- Liu, S., Y. Chen, **T. W. Sappington**, and B. C. Bonning. 2017. Genome sequence of *Diabrotica virgifera virgifera virus 2*, a novel small RNA virus of the western corn rootworm,

- Diabrotica virgifera virgifera* LeConte. *Genome Announc.* 5(20):e00365-17. doi: 10.1128/genomeA.00365-17.
- Liu, S., Y. Chen, **T. W. Sappington**, and B. C. Bonning. 2017. Genome sequence of the first coleopteran iflavivirus isolated from western corn rootworm, *Diabrotica virgifera virgifera* LeConte. *Genome Announc.* 5(6): e01530-16. doi: 10.1128/genomeA.01530-16
- Cheng, Y., L. Luo, **T. W. Sappington**, X. Jiang, L. Zhang, and A. N. Frolov. 2016. Onset of oviposition triggers abrupt reduction in migratory flight behavior and flight muscle in the female beet webworm, *Loxostege sticticalis*. *PLoS ONE* 11(11): e0166859.
- Tang, J., Y. Cheng, **T. W. Sappington**, X. Jiang, L. Zhang, and L. Luo. 2016. Egg hatch and survival and development of beet webworm (Lepidoptera: Crambidae) larvae at different combinations of temperature and relative humidity. *J. Econ. Entomol.* 109(4): 1603-1611.
- Jiang, X., L. Zhang, H. Yang, **T. W. Sappington**, Y. Cheng, and L. Z. Luo. 2016. Biocontrol of the oriental armyworm, *Mythimna separata* by the tachinid fly, *Exorista civilis*, is synergized by Cry1Ab protoxin. *Sci. Rep.* 6:26873. DOI: 10.1038/srep26873
- Andow, D. A., S. G. Pueppke, A. W. Schaafsma, A. J. Gassmann, **T. W. Sappington**, L. J. Meinke, P. D. Mitchell, T. M. Hurley, R. L. Hellmich, and R. P. Porter. 2016. *Forum*: Early detection and mitigation of resistance to *Bt* maize by western corn rootworm (Coleoptera: Chrysomelidae). *J. Econ. Entomol.* 109(1): 1-12.
- Coates, B. S., A. Alves, H. Wang, X. Zhou, T. Nowatzki, H. Chen, M. Rangasamy, H. M. Robertson, C. W. Whitfield, K. K. Walden, S. D. Kachman, B. W. French, L. J. Meinke, D. Hawthorne, C. A. Abel, **T. W. Sappington**, B. D. Siegfried, and N. J. Miller. 2016. Quantitative trait locus mapping and functional genomics of an organophosphate resistance trait in the western corn rootworm, *Diabrotica virgifera virgifera*. *Insect Mol. Biol.* 25(1): 1-15.
- Cheng, Y., K. Wang, **T. W. Sappington**, L. Luo, and X. Jiang. 2015. Response of reproductive traits and longevity of beet webworm to temperature, and implications for migration. *J. Insect Sci.* 15(1): 154; DOI: 10.1093/jisesa/iev135.
- Zhang, L., P. Pan, **T. W. Sappington**, W. Lu, L. Luo, X. Jiang. 2015. Accelerated and synchronized oviposition induced by flight of young females may intensify larval outbreaks of the rice leaf roller. *PLoS ONE* 10(3): e0121821.
- Nagoshi, R. N., N. M. Rosas-García, R. L. Meagher, S. J. Fleischer, J. K. Westbrook, **T. W. Sappington**, M. Hay-Roe, J. M. G. Thomas, and G. M. Murúa. 2015. Haplotype profile comparisons between *Spodoptera frugiperda* (Lepidoptera: Noctuidae) populations from Mexico with those from Puerto Rico, South America, and the United States and their implications to migratory behavior. *J. Econ. Entomol.* 108: 135-144.
- Sappington, T. W.**, and C. S. Burks. 2014. Patterns of flight behavior and capacity of unmated navel orangeworm (Lepidoptera: Pyralidae) adults related to age, gender, and wing size. *Environ. Entomol.* 43: 696-705.
- French, B. W., B. S. Coates, and **T. W. Sappington**. 2014. Inheritance of an extended diapause trait in the northern corn rootworm, *Diabrotica barberi* (Coleoptera: Chrysomelidae). *J. Appl. Entomol.* 138: 213-221.
- Dyer, J. M., **T. W. Sappington**, and B. S. Coates. 2013. Evaluation of tolerance to *Bacillus thuringiensis* toxins among laboratory-reared western bean cutworm (Lepidoptera: Noctuidae). *Journal of Economic Entomology* 106(6): 2467-2472.

- Coates, B. S., L. M. Fraser, B. W. French, and **T. W. Sappington**. 2013. Proliferation and copy number variation of BEL-like long terminal repeat retrotransposons within the *Diabrotica virgifera virgifera* genome. *Gene* 534: 362-370.
- Wang, H., B. S. Coates, H. Chen, **T. W. Sappington**, T. Guillemaud, and B. D. Siegfried. 2013. Role of a gamma-aminobutyric acid (GABA) receptor mutation in the evolution and spread of *Diabrotica virgifera virgifera* resistance to cyclodiene insecticides. *Insect Mol. Biol.* 22: 473-484.
- Kong, H., L. Luo, **T. W. Sappington**, X. Jiang, L. Zhang, and Y. Cheng. 2013. Density-dependent prophylaxis in crowded beet webworm, *Loxostege sticticalis* (Lepidoptera: Pyralidae) larvae to a parasitoid and a fungal pathogen. *Int. J. Pest Management* 59: 174-179.
- Coates, B. S., H. Johnson, K.-S. Kim, R. L. Hellmich, C. A. Abel, C. Mason, and **T. W. Sappington**. 2013. Frequency of hybridization between *Ostrinia nubilalis* E- and Z-pheromone races in regions of sympatry within the United States. *Ecol. Evol.* 3(8): 2459-2470.
- Jiang, X. F., J. Chen, L. Zhang, **T. W. Sappington**, L. Z. Luo. 2013. Increased long-flight activity triggered in beet armyworm by larval feeding on diet containing CryIAC protoxin. *PLoS ONE* 8(5): e63554.
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