# David William Crowder – Curriculum Vitae (Updated August 10, 2025)

Department of Entomology
Washington State University
166 FSHN Building
Pullman WA 99164-6382

Telephone: (509) 335-7965
Email: dcrowder@wsu.edu

## Personal

Born July 14, 1980 in Columbia, MO, USA

## Positions Held

| | |
|---|---|
| 2025-present | Assistant Director, Molecular Plant Sciences Graduate Program, Washington State University (WSU) |
| 2023-present | Professor, Department of Entomology, WSU |
| 2021-present | Director, Decision Aid Systems, WSU |
| 2021-present | Affiliate Faculty, Molecular Plant Sciences Graduate Program, WSU |
| 2021-present | Affiliate Faculty, Teaching Academy, WSU |
| 2018-present | Affiliate Faculty, Center for Interdisciplinary Statistics and Education, WSU |
| 2018-present | Adjunct Faculty, School of Biological Sciences, WSU |
| 2018-2023 | Associate Professor, Department of Entomology, WSU |
| 2012-2018 | Assistant Professor, Department of Entomology, WSU |
| 2009-2012 | Postdoctoral Associate, Department of Entomology, WSU |
| 2008-2009 | Postdoctoral Associate, Department of Entomology, University of Arizona |

## Education

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|---|---|
| Ph.D. | University of Arizona, Entomology, Aug. 2008 |
| M.S. | University of Illinois, Natural Resources and Environmental Sciences, Aug. 2004 |
| B.S. | University of Illinois, Natural Resources and Environmental Sciences, May 2003 (high honors) |

## Graduate Students Mentored

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|---|---|
| 2025-present | Taylor Stephens (PhD, MPS) – "*Effects of soil microbes on switchgrass*" |
| 2024-present | Michelle Marcano (MS, ENT) – "*Ecology of mite-borne pathogens in corn*" |
| 2023-present | Taydin Macon (PhD, ENT) – "*Ecology of European foul brood pathogen*" |
| 2022-present | Chase Baerlocher (PhD, MPS) – "*Plant-insect-microbe interactions in peas*" |
| 2021-present | Salena Helmreich (PhD, ENT) – "*Effects of pulsed blooms on bee health*" |
| 2021-present | Camille Wagstaff (PhD, MPS) – "*Molecular ecology of crop pathogens*" |
| 2021-present | Emily Rampone (PhD, ENT) – "*Modeling dynamics of potato crop pests*" |
| 2021-2023 | Olivia Shaffer (MS, ENT) – "*Effects of canola on bee foraging behavior*" |
| 2021 | Christopher Cote (PhD, MPS) – "*Ecology of soil microbes*" (rotation student) |
| 2020-2023 | Mario Luppino (PhD, ENT) – "*Assessing bee health across landscapes*" |
| 2020-2022 | Megan Blance (MS, ENT) – *"Effects of weedy hosts on aphid-borne viruses"* |
| 2019-2023 | Jillian Foutz (MS, ENT) – "*Ecology of beet leafhopper in Washington*" |

2019-2021 Pooja Malhotra (MS, ENT) – "*Molecular aspects of aphid-virus interactions*"
2018-2023 Dowen Jocson (PhD, ENT) – "*Acoustic mating disruption of pear psyllids*"
2017-2019 Elisabeth Oeller (MS, ENT) – *"Pest management in quinoa crop systems"*
2017-2019 Maggie Freeman (MS, ENT) – "*Biological control of lily leaf beetle*"
2016-2021 Benjamin Lee (PhD, ENT) – "*Effects of predators on a vectored pathogen*"
2016-2021 Abigail Cohen (PhD, ENT) – "*Ecology of potato psyllids and Zebra Chip"*
2015-2020 Rae Olsson (PhD, ENT) – "*Assessing bee communities in canola crops"*
2013-2019 Elias Bloom (PhD, ENT) – "*Pollinator communities in urban organic farms*"
2014-2018 Robert Orpet (PhD, ENT) – "*Dynamics of aphids in apple orchards*"
2013-2017 Paul Chisholm (PhD, ENT) – "*Ecology of plant-insect-virus interactions*"
2013-2015 Elizabeth D'Auria (MS, ENT) – "*Modeling pests in potato agroecosystems*"
2012-2015 Ivan Milosavljevic (PhD, ENT) – "*Ecology and management of wireworms"*
2010-2012 Elliott Moon (MS, STAT) – *"Ecoinformatics of potato agroecosystems"*

## Research Assistant Professors Mentored (all transitioned from postdoc)

2023-present Gengping Zhu – "*Invasive insect ecology laboratory*"
2023-2024 Saumik Basu – "*Insect molecular biology laboratory*"
2020-present Javier Gutierrez Illan – "*Arthropod disease ecology laboratory*"
2020-2023 Robert Clark – "*Insect data science laboratory*"

## Postdoctoral Scholars Mentored

2024-present Owusu Aidoo – "*Landscape ecology of invasive hornets*"
2024-present Jose-Maria Garcia Carrasco – "*Forecasting tick-borne pathogens*"
2023-present Riley Anderson – "*Time series modeling of insect pest populations*"
2023-present Diego Rincon – "*Forecasting aphid populations in pea ecosystems"*
2022-2024 Savannah Bartel – "*Exploring ecosystem effects of Tasmanian devils*"
2020-2023 Gengping Zhu – *"Landscape ecology of invasive insects*"
2019-2022 Vera Pfeiffer – "*Landscape genetics of bumblebees in canola crops*"
2017-2023 Saumik Basu – *"Molecular plant-herbivore-virus interactions"*
2017-2020 Javier Gutierrez Illan – *"Landscape ecology of insect pests"*
2017-2020 Robert Clark – *"Effects of tri-trophic interactions on a plant virus"*
2016-2018 Robert Schaeffer – "*Cross-kingdom interactions in organic farms*"
2016 Eric Moise – "*Community ecology of Zebra Chip disease*"
2015-2016 Ivan Milosavljevic – "*Ecology and management of wireworms"*
2013-2015 Elinor Lichtenberg – "*Pollinator diversity and behavior in canola*"

## Supervision of Senior Staff

2025-present Jesse Trammell, *Lead Developer, WSU Decision Aid System*
2025-present Arianna Espinosa, *Molecular Biology Technician, Crowder Lab*
2024-present Izzy McDonald, *Developer, WSU Decision Aid System*
2024-2025 Jea-Hee Kwak, *Chemical Ecology Technician, Crowder Lab*
2023-2025 Logan Mock, *Developer, WSU Decision Aid System*
2023-2025 Jesse Trammell, *Developer, WSU Decision Aid System*
2022-present Liesl Oeller – *Crowder Lab and WSU Decision Aid System Coordinator*

2022-2024 Anna Rodgers – *Molecular Biology Technician, Crowder Lab*
2022-2023 Matt Brousil –*Data Scientist, WSU Decision Aid System*
2021-2025 Stefano Borghi – *Lead Developer, WSU Decision Aid System*
2020-present Chris Gorman – *Lead Molecular Biology Technician, Crowder Lab*
2015-2017 Matt Brousil – *Crowder Lab Coordinator*

## Graduate Student Committees Served On

2025-present Janae Becher, PhD Entomology (WSU)
2022-2025 Baily McCulloch, MS Biological Sciences (WSU)
2020-2022 Jeremy Roberts, MS Entomology (WSU)
2018-2020 Katlyn Nielsen, MS Biological Sciences (WSU)
2017-2019 James Hepler, PhD Entomology (WSU)
2017-2019 Joshua Milnes, MS Entomology (WSU)
2016-2022 Evan Hilpman, PhD Biological Sciences (WSU)
2016-2019 Joseph Taylor, PhD Entomology (WSU)
2016-2018 Megan Asche, MS Entomology (WSU)
2015-2020 Alexandra Fraik, PhD Biological Sciences (WSU)
2015-2020 Adrian Marshall, PhD Entomology (WSU)
2015-2018 Emily Wine, MS Entomology (WSU)
2014-2017 Jacob Asplund, MS Entomology (WSU)
2014 Brandon Hopkins, PhD Entomology (WSU)
2013-2019 Rachel Wieme, PhD Soil Sciences (WSU)
2013-2018 Matt Jones, PhD Entomology (WSU)
2013-2018 Alex Whitener, PhD Entomology (WSU)
2013-2017 Karol Krey, PhD Entomology (WSU)
2013-2016 Megan Taylor, PhD Entomology (WSU)
2013-2016 Nathan Foote, MS Plant, Soil and Entomological Sciences (Idaho)
2013-2015 Carmen Castillo, PhD Entomology (WSU)
2013-2015 Conor O'Leary, MS Entomology (WSU)
2013-2015 Rebecca Schmidt, PhD Entomology (WSU)
2013-2015 Samantha Whiteside, MS Entomology (WSU)
2013-2014 Fatima Arabi, MS Mathematics (WSU)
2012-2019 Katie Buckley, PhD Entomology (WSU)
2012-2017 Holly Bowers, PhD Environmental Sciences (WSU)

## Invited PhD Dissertation Opponent

2023 Janina Heinen, PhD Ecology, Swedish University of Agricultural Sciences.

## Undergraduate and High-School Student Research Projects Mentored

† WSU Auvil Fellowship (competitive undergraduate research award)
‡ WSU Research Award (annual award for excellent research project in Ecology and Evolution)
◊ WSU Emeritus Society Award (competitive award for excellence in biological research)
§ WSU Mathematics and Biology Fellow (NSF funded undergraduate research fellowship)
¶ WSU James A. Weir Undergraduate Research Fellow (competitive undergraduate research award)

2025-present Karlye Ebberson – "*Molecular ecology of tick-borne pathogens in corn*"
2025-present Aditya Sengupta – "*Using AI to improve pest prediction models*"
2024-present Abigail Clough – "*Gut content analysis of beet leafhopper*"
2024-2025 Audrey Coon – "*Gut content analysis of beet leafhopper*"
2023-2025 Kate Prophet – "*Using interpolation to predict potato pest outbreaks*"
2023-2025 Izzy McDonald – "*Predicting aphid outbreaks in legume crop systems*"
2023-2024 Molly Jobson – "*Molecular ecology of vector-borne pathogens*"
2022-2024 Arianna Espinosa – "*Molecular ecology of vector-borne pathogens*"
2022-2024 Abraham Munoz - "*Behavior of scavengers in Tasmania*"
2022-2024 George Fitzgerald – "*Behavior of scavengers in Tasmania*"
2022-2024 Elliott McDonald – "*Behavior of scavengers in Tasmania"*
2023-2024 Ian Ellard – "*Predicting adaptation of aphid phenology to climate change*"
2022-2024 Claire Winslow – "*Assessing phenology of potato pests*"
2022-2023 Bailey Brynelson – "*Predicting aphid outbreaks in legume crop systems*"
2021-2024 Jillian Wroughton – "*Molecular ecology of vector-borne pathogens*"
2021-2023 McKayla Michener – "*Predicting aphid outbreaks in legume crop systems"*
2021-2023 Marissa Gomez – "*Acoustic mating disruption in pear psylla*"
2021-2023 Joseph Heitman – "*Acoustic mating disruption in pear psylla"*
2021-2022 Abigail Clooney – "*Acoustic mating disruption in pear psylla*"
2021-2022 Jennifer Knoblauch – "*Predicting aphid outbreaks in legume crop systems*"
2021-2022 Juliana Miranda – "*Physical defenses of legumes in response to viruses*"
2020-2023 Anna Roberts – "*Molecular ecology of vector-borne pathogens*"
2020-2022 Michelle Chavez – "*Phenotyping legumes in response to aphids*"
2020-2022 Chase Baerlocher – "*Molecular ecology of vector-borne pathogens*"
2020-2022 John Eastman – "*Molecular ecology of vector-borne pathogens in potato*"
2020-2021 Joshua Gibson - "*Molecular ecology of vector-borne pathogens*"
2020-2021 Laura Braley - "*Molecular ecology of vector-borne pathogens in potato*"
2020-2021 Jack Thompson – "*Community ecology of aphid-borne viruses*"
2020-2021 Shelby Johnson - *Plant defense responses against aphids and viruses*"
2020-2021 Andrew Hansted - "*Community ecology of aphid-borne viruses*"
2020-2021 Calie Vaughn – "*Plant defense responses against aphids and viruses*"
2020 Eric Acevedo – "*Exploring canola traits that affect pollinators*"
2020 Maya Eastman – "*Exploring canola traits that affect pollinators*"
2020 Gabrielle Mickelson – "*Effects of weeds on viruses in legume crops*"
2019-2021 Mark Gonzalez – "*Acoustic mating disruption of pear psylla*"
2019-2021 Logan Hope – "*Temporal dynamics of aphids on the Palouse*"
2019-2021 Kennedy Langohr – "*Temporal dynamics of aphids on the Palouse*"
2019-2020 Molly Wisner – "*Temporal dynamics of aphids on the Palouse"*
2019-2020 Macey McNamara – "*Community ecology of aphid-borne viruses*"
2019-2020 Jesus Ramirez – "*Molecular ecology of vector-borne pathogens*"
2019 Peter Schulteis – "*Effects of wild legumes on viruses in legume crops*"
2019 Kayla Dilworth – "*Biodiversity of ants on the Palouse*"
2018-2020 Logan Dean – "*Temporal dynamics of aphids on the Palouse*"
2018-2020 Madison Armstrong – "*Impact of PPCPs on pollinators*"
2018 Amber Hailey – "*Effects of viruses on non-crop legumes*"
2018 Rylee McNannay – "*Effects of viruses on non-crop legumes*"

2018 Dana Roach – "*Influence of food web interactions on aphids and viruses"*
2017-2020 Wyatt Mattingly – "*Traits of pollinators in canola crops*"
2017-2019 Lucille Eggleston – "*Plant-pollinator networks on organic farms*"
2017-2019 Abby Plotnit – "*Plant-pollinator networks on organic farms*"
2017 Kristin Nesbitt – *"Influence of predators on pea aphids and viruses"*
2016-2018 Harriet Harris – "*Pollinator traits in canola crops*"
2016-2018 Cesar Hernandez – "*Influence of predators on pea aphids and viruses*"
2016 Abigail Cate – *"Functional diversity of wild bees on organic farms"*
2016 Spencer Hills – "*Influence of pea viruses on aphid settlement behavior*"
2015-2018 Akaisha Charlton – *"Can intercropping slow the spread of pea viruses"*
2015-2018 Kaitlin Krouse – "*Pest outbreaks in potato crop systems*"
2015-2016 Chris Marshall – "*Agricultural intensification and pest outbreaks*"
2015-2016 Konner Fleming – *"Traits of bees in organic farming systems"*
2014 Bryla Jones – "*Interactions between predators and bees on canola*"
2014 Jacob Cohen – "*Wireworm-virus interactions in wheat*"
2013-2015 Gabe Wetzel – "*Biodiversity of pollinators in canola*"
2013-2015 Kayla McBride – "*Biodiversity of pollinators in canola*"
2013-2016 Philip Behrend† – "*Assessing the dilution effect in disease ecology*"
2013-2014 Lily Warto – "*Does* a*gricultural intensification increase pest problems?"*
2013-2014 Janelle Badger – "*Effect of virus infection on aphid fitness*"
2013 Jordan Bailey – "*Climate change and wireworm-aphid interactions*"
2012-2014 Tina Miller†¶ – "*Non-lethal effects of predators on herbivore fitness"*
2012 Kerri Wheeler – "*Effects of climate change on insects in potato crops"*
2011-2013 Margaret Schoenfeld§ – "*Natural diversity and resource consumption*"
2011 Elliott Moon – "*Landscape ecology of pest/predator diversity in potato*"
2010-2011 Emily Martin† – "*Effects of agriculture on the spread of West Nile virus*"
2010-2011 Catherine Erickson§ – "*Acquired immunity in vertebrates affects ticks"*
2009-2011 Jacob Gable‡◊ – "*Bottom-up mediation of predator diversity effects*"
2009-2010 Elizabeth Aultman†‡ – "*Effects of nematode diversity on host mortality*"
2008 Ashley Eldridge –"*Predicting the invasive spread of whiteflies*"
2008 Oluchukwo Okonkwo –"*Predicting the invasive spread of whiteflies*"
2007-2008 Ann Showalter – "*Reproductive interference between whitefly species*"
2007-2008 Michael Sitvarin – "*Mating interactions between whitefly species*"

## Awards and Honors

2025 Frontiers Planet Prize, International Winner (one of three awardees for the most impactful article on agriculture in 2025, team member) ($1M prize)
2025 Frontiers Planet Prize, United States Winner (most impactful article on agriculture in the United States in 2025, team member)
2023 WSU CAHNRS Faculty Research Award
2023 WSU Mid-Career Faculty Award
2020 Inducted into WSU Teaching Academy
2018 Outstanding Extension Project Award, Potato Association of America
2017 Pacific Branch of the Entomology Society Plant-Insect Ecosystems Award
2017 WSU CAHNRS Early Career Excellence Award
2017 WSU CAHNRS Team Interdisciplinary Award (Member of Small Grains Team)

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| 2016 | International Organization for Biological Control Early Career Scientist Award |
| 2015 | WSU CAHNRS Team Interdisciplinary Award (Member of Quinoa Team) |
| 2014 | WSU Honors College Thesis Advisor Award |
| 2013-2014 | Washington Wheat Distinguished Professorship (endowed position) ($60,000/yr) |
| 2012 | Entomological Society of America Travel Award ($2,600) |
| 2010 | Entomological Society of America Postdoctoral Research Award ($1,000) |
| 2005-2008 | Achievement Rewards for College Scientists Scholarship ($55,975) |
| 2005-2008 | University of Arizona Graduate College Research Grant ($6,000) |
| 2006-2007 | University of Arizona Carruth Scholarship in Entomology ($1,955) |
| 2006 | University of Arizona Center for Insect Science Travel Award ($500) |
| 2004-2005 | University of Arizona Graduate College Fellowship ($5,000) |
| 2004 | University of Arizona Center for Insect Science Travel Award ($300) |
| 2004 | University of Illinois Graduate Student Research Award ($1,000) |
| 2003-2004 | University of Illinois Jonathan Baldwin Turner Fellowship ($15,000) |
| 1998-2002 | Scientific Atlanta Scholarship ($6,000) |

## Awards and Honors for Members of Crowder Laboratory

### *Postdoctoral Scientists and Research Assistant Professors*

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| 2024 | Pacific Branch of Entomology Society Excellence in Teaching Award (Illan) |
| 2023 | Inducted into WSU Teaching Academy (Illan) |

### *Graduate Students*

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|---|---|
| 2025 | WSU CAHNRS Three Minute Thesis First Place (Wagstaff) ($1,000) |
| 2025 | WSU Molecular Plant Sciences Research Award (Baerlocher) ($20,639) |
| 2024 | WSU CAHNRS Three Minute Thesis First Place (Baerlocher) ($1,000) |
| 2024 | WSU CAHNRS Three Minute Thesis Second Place (Wagstaff, tie) ($500) |
| 2024 | WSU CAHNRS Three Minute Thesis Second Place (Macon, tie) ($500) |
| 2024 | Washington State Beekeepers Association Scholarship (Macon) ($5,000) |
| 2023-2026 | ARCS Foundation Scholarship (Macon) ($22,500) |
| 2023-2025 | WSU Graduate Diversity Advancement Pathways Program (Macon) ($20,000) |
| 2023 | Washington State Beekeepers Association Scholarship (Macon) ($2,000) |
| 2023 | Lawrence Hickman Fellowship in Sustainable Agriculture (Baerlocher) ($5,000) |
| 2023 | Pacific Branch of Entomology Society John Henry Comstock Award (Jocson) |
| 2023 | WSU Entomology Travel Scholarship (Helmreich) ($1,000) |
| 2022-2025 | ARCS Foundation Scholarship (Wagstaff) ($17,500) |
| 2022 | WSU Entomology PhD Student of the Year (Jocson) ($2,000) |
| 2022 | WSU Entomology MS Student of the Year (Blance) ($2,000) |
| 2022 | WSU Entomology Travel Awards (Shaffer, Helmreich, Blance) ($750 each) |
| 2022 | NSF Graduate Research Fellowship Honorable Mention (Helmreich) |
| 2021 | Lawrence Hickman Fellowship in Sustainable Agriculture (Lee) ($5,000) |
| 2021 | ARCS Foundation Dottie L Simpson Leadership Award (Jocson) ($5,000) |
| 2020 | WSU Entomology PhD Student of the Year (Lee) ($2,000) |
| 2020 | WSU Entomology MS Student of the Year (Oeller) ($2,000) |
| 2017-2020 | ARCS Foundation Scholarship (Jocson) ($17,500) |
| 2017 | WSU Entomology Student of the Year (Orpet) ($1,000) |

2017 WSU TFREC Hambelton Research Scholarship (Orpet) ($1,000)
2017 WSU Errett Deck Fellowship (Orpet) ($2,500)
2017 Pacific Branch of Entomology Society Travel Award (Olsson) ($300)
2017 WSU Entomology Travel Award (Cohen) ($800)
2017 WSU Entomology Howard and Hermina Hallgarth Scholarship (Bloom) ($700)
2016-2019 ARCS Foundation Scholarship (Lee) ($17,500)
2016 WSU Entomology Travel Award (Bloom, Chisholm) ($300-600)
2016-2017 WSU Russ and Anne Fuller for Interdisciplinary Research (Orpet) ($8,000)
2015 Pacific Branch of Entomological Society Best Presentation (Chisholm)
2015 WSU Entomology Travel Awards (Chisholm, Olsson, Orpet) ($300-$600)
2015 NSF Graduate Research Fellowship Honorable Mention (Olsson)
2014-2017 ARCS Foundation Scholarship (Orpet) ($17,500)
2014 WSU Entomology Travel Award (Chisholm, Milosavljevic, D'Auria) ($200-600)
2014 Presidents Prize, Entomological Society of America (Chisholm, Orpet)
2014 NSF Graduate Research Fellowship Honorable Mention (Chisholm)
2014 WSU Entomology Student Research Award (Milosavljevic) ($500)
2013 WSU Graduate Student Travel Awards (Chisholm, Milosavljevic) ($400-600)
2012 WSU Entomology Travel Award (Milosavljevic) ($550)

***Undergraduate Students***

2024 WSU College of Arts and Sciences Senior of the Year (McDonald)
2017 WSU Student Showcase Early Career Award (Cate)
2014 WSU Student Showcase Crimson Award (Best Presentation) (Badger)
2014 WSU Honors College "Pass with Distinction" (Miller)
2013 WSU Student Showcase Gray Award (Second Place Presentation) (Martin)
2013 WSU Auvil Fellowship (Behrend)
2012 WSU Auvil Fellowship (Miller)

## Grant Support

***Extramural***

2025-2026 Developing new tools to predict migration of insect vectors into potato crops. USDA ARS-State Partnership Potato Program (PI, 1 co-PI) ($74,929).
2025-2026 Biology and management of European crane fly. Northwest Turfgrass Association (co-PI, PI: G Zhu) ($6,000).
2025-2026 Developing a decision support system for naval orangeworm. California Almond Research Board (PI, two co-PIs) ($21,075).
2025-2026 Developing a decision support system for naval orangeworm. California Pistachio Research Board (PI, two co-PIs) ($21,075).
2024-2027 Beet leafhopper and associated pathogens in Columbia Basin: impact of crop type and abiotic factors. WSDA Specialty Crop Block Grant (co-PI, PI: K Swisher-Grimm) ($249,517).
2024-2026 Quantitatively assessing key risk factors that drive potential tick and Babesia outbreaks in the United States. USDA Animal Disease Research Program (co-PI, PI: J Gutierrez Illan) ($200,000).
2024-2025 Developing new tools to predict migration of insect vectors into potato crops.

USDA ARS-State Partnership Potato Program (PI, 1 co-PI) ($72,789).

2024-2025 Mitigating Emerald ash borer threats in the Pacific West. Washington/Oregon Bureau of Land Management Weeds and Invasive Species Program (PI, 1 co-PI) ($50,000).

2024-2025 Development of crop protection guide and decision aid system for grapes. Washington Wine Grape Commission (co-PI, PI: G Hoheisel) ($35,000).

2024 Modeling Emerald ash borer spread in Oregon. Oregon Department of Agriculture (PI, 1 co-PI) ($20,000).

2023-2027 Elucidating the epidemiology, risk of seed transmission, and management of High Plains wheat mosaic and wheat streak mosaic viruses to facilitate export of sweet corn seed to Chile and New Zealand. USDA Technical Assistance for Specialty Crops Program (co-PI, P: L du Toit) ($1,397,443).

2023-2027 Enhancing integrated insect pest management strategies for U.S. potato production systems. USDA Specialty Crop Research Initiative (co-PI, PI: Z Szendrei) ($8,000,000).

2023-2026 Beyond honey bees: building towards resilient pollination for blueberry (co-PI, PI: L DeVetter). WSDA Specialty Crop Block Grant ($191,229).

2023-2024 Improved lure development and models to aid in eradication of Northern giant Hornet. USDA APHIS Pollinator Program (PI, 1 co-PI) ($258,111).

2022-2026 Cues to care neighborhood greening to aid human and bee well-being in legacy suburbs. NSF Dynamics of Integrated Socio-Environmental Systems Program (co-PI, PI: M Gardiner) ($1,599,748).

2022-2025 Assessing effects of mating disruption on codling moth phenology. Washington State Tree Fruit Commission (PI, 2 co-PIs) ($255,000).

2022-2023 Improving capacity for WSU DAS and AWN. Washington State Tree Fruit Commission (PI, 1 co-PI) ($100,000).

2021-2025 Applying time-series models to predict outbreaks of aphids and pathogens in crops and non-crop weedy hosts. USDA AFRI Foundational Program (PI, 1 co-PI) ($710,000).

2021-2025 Effects of top scavenger declines: from microbes to ecosystems. NSF Ecosystems Program (PI, 1 co-PI) ($399,616).

2021-2022 Developing and validating models for tree fruit. Washington Tree Fruit Research Commission (PI, 1 co-PI) ($207,000).

2020-2025 Develop predictive models of potential babesia disease spread in the US to assist in mitigating potential future outbreaks. USDA Animal Disease Research Program (PI, 2 co-PIs) ($400,000).

2020-2021 Improved risk modeling and monitoring for invasive fruit pests. USDA Plant Pest and Disease Management and Disaster Prevention Program (PI, 1 co-PI) ($164,418).

2020-2021 Using vibrational communication for pear psylla mating disruption and pest management. Washington State Commission on Pesticide Registration (PI, 1 co-PI) ($24,768).

2019-2023 Areawide management of insect vectors in Columbia Basin vegetable and seed crops USDA ARS Areawide Integrated Pest Management Program (PI, 3 co-PIs) ($2,212,983).

2019-2022 Managing potato purple top: leafhopper and BLTVA landscape ecology. Washington State Specialty Crop Block Grant Program (co-PI, PI: K Swisher-Grimm) ($244,631).

2019-2021 New technologies and strategies to manage the changing pest complex on temperate fruit trees. USDA Innovation Fund (co-PI, PI: D Horton) ($21,000).

2019-2020 Molecular and landscape approaches to understanding beet leafhopper and potato purple top disease in the Columbia Basin. Northwest Potato Research Consortium (co-PI, PI: R Cooper) ($60,467).

2019-2020 Evaluating effects of non-crop hosts on beet leafhopper and purple top pathogen. Washington State Commission on Pesticide Registration (PI, 3 co-PIs) ($19,786).

2019-2020 Understanding factors affecting beet leafhopper and potato purple top disease in Washington. USDA ARS-State Partnership Potato Program (co-PI, PI: R Cooper) ($45,000).

2019-2020 Improved risk modeling and monitoring for invasive fruit pests. USDA Plant Pest and Disease Management and Disaster Prevention Program (co-PI, PI: L Neven) ($171,444).

2018-2020 Exploring relationships between pollinators and canola on the Palouse Western SARE Research and Education Program (PI, 2 co-PIs) ($207,133).

2018-2020 Optimizing sterile insect release of codling moth in Washington. Washington Tree Fruit Research Commission (co-PI, PI: B Beers) ($300,017).

2018-2019 Improved risk modeling and monitoring for invasive fruit pests. USDA Plant Pest and Disease Management and Disaster Prevention Program (co-PI, PI: L Neven) ($151,200).

2017-2021 Developing and validating models for tree fruit pests. Washington Tree Fruit Research Commission (PI, 2 co-PIs) ($207,205).

2017-2020 Exploring mechanisms mediating plant-virus-herbivore interactions in legume crops. USDA AFRI Foundational Program (PI, 1 co-PI) ($475,024).

2017-2020 Acoustically based mating disruption of winterform psylla. Washington Tree Fruit Research Commission (PI, 2 co-PIs) ($155,660).

2017-2020 Evaluating and improving biological control of woolly apple aphid. Washington Tree Fruit Research Commission (co-PI, PI: V Jones) ($228,512).

2017-2019 Developing predictive pollination models to transform pollination management. New Zealand Discovery Science Program (co-PI, PI: D Pattemore) ($700,000).

2016-2022 Management of brown marmorated stink bug in US specialty crops. USDA Specialty Crop Research Initiative (one of six co-PDs, 18 co-PIs) ($9,174,908).

2016-2019 Improving integrated pest management of wireworms in cereal crops. USDA Crop Protection and Pest Management Program (PI, 2 co-PIs) ($324,983).

2016-2020 Breeding and agronomy of quinoa for organic farming systems. USDA Organic Research and Extension Initiative (co-PI, PI: K Murphy) ($1,999,950).

2016-2019 Expanding the WSU decision support systems in potato and tree fruit. Washington State Specialty Crop Block Grant Program (co-PI, PI: V Jones) ($243,023).

2015-2020 MAP-PSILDS-PNW: mapping and predicting psyllid sources, immigration and locality-specific disease spread in the PNW. USDA Specialty Crop Research Initiative (PI, 11 co-PIs) ($2,688,111).

2014-2018 Promoting native bee health and pollination services on diversified organic produce farms. USDA Organic Transitions Program (PI, 3 co-PIs) ($499,991.

2014-2017 Evaluating aphid pest management and soil quality on organic and conventional apple orchards in Washington. Washington State Specialty Crop Block Grant Program (PI, 4 co-PIs) ($194,910).

2014-2017 Causes and consequences of vector movement: implications for the spread of plant pathogens. National Institute for Mathematical and Biological Synthesis (PI, 2 co-PIs) (90,000).

2014-2016 Dynamics of woolly apple aphids on organic and conventional orchards. Washington Tree Fruit Research Commission (PI, 3 co-PIs) ($113,948).

2014-2016 Wireworm control in wheat-based cropping systems. Washington Grain Commission (PI, 1 co-PI) ($120,000).

2013-2016 Extension education for wheat and barley growers. Washington Grain Commission (co-PI, PI: D Lyon) ($150,000).

2013-2014 Miticide resistance in spider mite pests of pears. Washington State Tree Fruit Research Commission (co-PI, PI: B Beers) ($48,616).

2013-2014 Ecology of the potato psyllid in Washington. Washington State Committee on Pesticide Registration (co-PI, PI: W Snyder) ($25,000).

2013-2014 Ecology of the potato psyllid in Washington. Washington State Potato Commission (co-PI, PI: W Snyder) ($44,856).

2013-2014 Monitoring populations of pest aphids and their associated viruses in the Palouse region. US Dry Pea & Lentil Council Grant (co-PI, PI: S Eigenbrode) ($25,153).

2013 Investigative workshop on genetics of insecticide resistance. National Institute for Mathematical and Biological Synthesis (PI, 1 co-PI) ($25,000).

2011-2013 Can reduced-input farming restore biocontrol communities degraded by climate change? USDA-AFRI NIFA Fellowship Program (PI) ($130,000).

2009-2012 Origin and spread of northern fowl mite: a landscape genetics approach. USDA-AFRI (co-PI, PI: J Owen) ($255,952).

2009-2013 Area-wide management of potato pests in the Pacific Northwest. USDA-RAMP (co-PI, PI: W Snyder) ($2,050,000).

2008-2009 Predicting and managing invasiveness of the Q biotype of the sweetpotato whitefly. Arizona Pest Management Center (co-PI, PI: Y Carrière) ($10,000).

2005-2008 Environmental Protection Agency Science to Achieve Results Fellowship (PI) ($111,344).

***Intramural***

2025-2026 Assessing effects of leafhoppers in hemp. WSU Emerging Research Opportunities in Cannabis Seed Grant Program (PI) ($40,000).

2025-2026 Evaluation of biomass-derived pyrolysis oils as a source of pesticides for insect

vectors of plant pathogens. WSU Biologically Intensive & Organic Agriculture Program (co-PI, PI: M Garcia-Perez) ($40,00).

2024 Developing an economic forecasting tool for small grains. WSU Economic Impact Center (PI) ($12,000).

2024 Developing a variety testing tool for small grains. WSU Small Grains Team (PI) ($18,000).

2023-2024 Mapping Colorado potato beetle to promote proactive management in potato. WSU Biologically Intensive & Organic Agriculture Program (PI, 1 co-PI) ($40,00).

2021-2022 Investigating sustainable and cost-effective strategies to expand production of food quality winter peas as a viable specialty crop in the Palouse. WSU Biologically Intensive & Organic Agriculture Program (PI, 1 co-PI) ($40,000).

2020-2021 Using alternative host plants to improve accuracy of forecasting models for pest aphids. WSU Biologically Intensive & Organic Agriculture Program (PI, 1 co-PI) ($40,000).

2017-2019 Exploring interactions between pollinators and canola on the Palouse. Washington Oilseed Cropping Systems Program (PI, 2 co-PIs) ($20,944).

2017-2018 Examining microbial mediation of disease resistance, pollinator attraction, and crop yield in apple crops. WSU Biologically Intensive & Organic Agriculture Program (PI, 1 co-PI) ($39,931).

2016-2018 CAHNRS course development and delivery ready assistantship. WSU CAHNRS Teaching Assistant Development Program (PI) ($59,287).

2015 Improving GIS-based decision support tools for Washington agriculture. WSU Decision Support Tools Grant Program (PI, 3 co-PIs) ($37,080).

2014-2015 Introducing organic quinoa production systems in the Palouse. WSU Emerging Research Initiatives Program (co-PI, PI: J Reganold) ($18,950).

2014-2015 Introducing organic quinoa production systems in the Palouse. WSU Biologically Intensive & Organic Agriculture Program (co-PI, PI: J Reganold) ($18,950).

2013-2015 Developing decision support tools for Pacific Northwest potato crops. WSU Extension Grant Program (PI, 3 co-PIs) ($50,000).

2013-2014 Exploring interactions between aphids and viruses on legume crops. WSU New Faculty Seed Grant Competition (PI) ($29,000).

2013 CAHNRS course development and delivery ready assistantship. WSU CAHNRS Teaching Assistant Development Program (PI w/L Lavine) ($54,688).

2012-2013 Effects of nematode genetic diversity on management of potato pests. WSU Biologically Intensive & Organic Agriculture Program (co-PI, PI: W Snyder) ($39,876).

2010-2011 Local and landscape-scale conservation of beneficial predators in Columbia Basin potato crops. WSU Biologically Intensive & Organic Agriculture Program (co-PI, PI: W Snyder) ($40,000).

***Decision Aid System Program Income***

2025-2027 WSU Decision Aid System – Canadian-Based Private Contract ($138,000)

2025 WSU Decision Aid System – US-Based Subscriptions ($91,000)

2025 WSU Decision Aid System – US-Based Private Contracts ($40,000)
2024 WSU Decision Aid System – US-Based Subscriptions ($122,251)
2024 WSU Decision Aid System – US-Based Private Contracts ($15,000)
2023 WSU Decision Aid System – US-Based Subscriptions ($127,680)
2023 WSU Decision Aid System – US-Based Private Contracts ($35,000)
2022-2024 WSU Decision Aid System – Canadian-Based Private Contract ($138,000)
2022 WSU Decision Aid System – US-Based Subscriptions ($131,940)
2021 WSU Decision Aid System – US-Based Subscriptions ($122,540)
2021 WSU Decision Aid System – Canadian-Based Private Contract ($45,500)

***Grants to Graduate Students and Postdocs in Crowder Lab***

2025-2027 Improving pest management with high-resolution temporal and spatial forecasting. USDA Postdoctoral Fellowship (PI: R Anderson) ($225,000).
2024-2027 Building decision support tools to enhance sustainability of potato and vegetable crops. USDA Predoctoral Fellowship (PI: E Rampone) ($180,000).
2021-2024 Using vibrational communication for mating disruption and pest management. USDA Predoctoral Fellowship (PI: D Jocson) ($180,000).
2019-2021 Exploring the effects of predators on aphids and aphid-borne viruses. USDA Predoctoral Fellowship (PI: B Lee) ($120,000).
2019-2021 Exploring the role of non-crop hosts and environmental stress on a vector-borne pathogen. USDA Predoctoral Fellowship (PI: A Cohen) ($120,000).
2018-2020 Effects of tri-trophic interactions on pea aphid dispersal and transmission of legume plant pathogens. USDA Postdoctoral Fellowship (PI: R Clark) ($165,000).
2018-2020 Reciprocal interactions between canola crop plants and bee pollinators. USDA Predoctoral Fellowship (PI: R Olsson) ($95,000).
2017-2018 Assessment of the positive and negative effects of earwigs in apple orchards. Western SARE Graduate Student Grant (PI: R Orpet) ($17,875).
2017-2018 Using ecological models and citizen science to evaluate wild bee pollination in urban areas. NSF Graduate Research Opportunities Worldwide Program (PI: E Bloom) ($10,000).
2016-2018 Microbial mediation of agroecosystem services. USDA Postdoctoral Fellowship (PI: R Schaeffer) ($150,608).
2016-2018 Polycultures and pollinators: does crop diversity promote pollination services by wild bees? USDA Predoctoral Fellowship (PI: E Bloom) ($93,232).
2015-2017 Examining relationships between insect pests, plant pathogens, and nitrogen fixation in legume cropping systems. USDA Predoctoral Fellowship (PI: P Chisholm) ($65,502).
2015-2017 Assessing the effects of non-bee insects on pollination in diversified organic farms. Western SARE Graduate Student Grant (PI: R Olsson) ($24,871).
2014-2017 Promoting native pollinators in urban and rural habitats of Washington. NSF Graduate Research Fellowship (PI: E Bloom) ($132,000).
2014-2016 Promoting native bee health and pollination services on diversified organic produce farms. Western SARE Graduate Student Grant (PI: E Bloom) ($24,918).

***Undergraduate Internships for Students in Crowder Lab***

| | |
|---|---|
| 2022 | Undergraduate internships in entomology. CAHNRS Undergraduate Research and Extension Internship Program ($2,500). |
| 2021 | Undergraduate internships in entomology. CAHNRS Undergraduate Research and Extension Internship Program ($2,500). |
| 2020 | Undergraduate internships in entomology. CAHNRS Undergraduate Research and Extension Internship Program ($2,500). |
| 2019 | Food systems summer internship. WSU Food Systems Research and Extension Experiences for Undergraduates Program ($6,000). |
| 2018 | Undergraduate internships in entomology. CAHNRS Undergraduate Research and Extension Internship Program ($2,500). |
| 2018 | REACCH summer internship. Regional Approaches to Climate Change (REACCH) Internship Program ($5,200). |
| 2017 | Undergraduate internships in entomology. CAHNRS Undergraduate Research and Extension Internship Program ($2,500). |
| 2017 | REACCH summer internship. Regional Approaches to Climate Change (REACCH) Internship Program ($5,200). |
| 2016 | Undergraduate internships in entomology" (2 awards). CAHNRS Undergraduate Research and Extension Internship Program ($2,500 and $4,000). |
| 2016 | REACCH summer internship. Regional Approaches to Climate Change (REACCH) Internship Program ($5,200). |
| 2015 | Undergraduate internships in entomology (2 awards). CAHNRS Undergraduate Research and Extension Internship Program ($2,500 and $4,000). |
| 2014 | Undergraduate internship in entomology. CAHNRS Undergraduate Research and Extension Internship Program ($2,500). |
| 2013-2014 | Undergraduate internship in entomology. CAHNRS Undergraduate Research and Extension Internship Program ($2,500). |
| 2013-2014 | Undergraduate internship in entomology/math. College of Arts and Sciences Undergraduate Summer Minigrant Program ($3,000). |

***Gifts and Development Funds***

| | |
|---|---|
| 2017 | Evaluating management options in hybrid poplars. Greenwood Resources Grant (co-PI, PI: T Waters) ($5,000). |
| 2016 | Evaluating management options in hybrid poplars. Greenwood Resources Grant (co-PI, PI: T Waters) ($9,200). |
| 2015 | Evaluating management options in hybrid poplars. Greenwood Resources Grant (co-PI, PI: T Waters) ($14,400). |
| 2014 | Evaluating management options in hybrid poplars. Greenwood Resources Grant (co-PI, PI: T Waters) ($14,000). |
| 2013 | Evaluating management options in hybrid poplars. Greenwood Resources Grant (co-PI, PI: T Waters) ($13,000). |
| 2013 | Chemtura seed treatment study. Chemtura AgroSolutions (co-PI, PI: A Esser) ($6,000). |
| 2013 | Valent seed treatment study. Valent, USA (co-PI, PI: A Esser) ($18,000). |
| 2013 | Syngenta seed treatment study. Syngenta Seed (co-PI, PI: A Esser) ($6,000). |

## Refereed Publications (Total Citations = 7,620; h-index = 38; Google Scholar)

* - Indicates senior authorship on publications written by my members of my laboratory

Footnotes: (1) Developed the initial idea; (2) Obtained or provided funds/resources; (3) Collected data; (4) Analyzed Data; (5) Wrote/created publication; (6) Edited publication.

155. Chesnais Q, Bahlai CA, Peace A, **Crowder DW,** Bosque-Perez NA, Mauck K (submitted) Evidence of adaptive host and vector manipulation by plant viruses revealed through combined meta-analysis and modeling approaches. *bioRxiv,* https://doi.org/10.1101/781690. (**3,4,6**)
154. Wyckhuys KAG, Zou Y, **Crowder DW**, Adriani E, Albaytar AB, Beltran MJB, Ben Fekih I, Camargo-Gil C, C Sta Cruz F, Cicero L, Colmenarez YC, Cuellar-Palacios CM, Dubios T, Eigenbrode SD, Francis F, Fereres A, Haddi K, Khamis FM, Le Lann C, Le Ralec A, Lopez L, Lyu B, Montoya-Lerma J, Munoz-Cardenas K, Nurkomar I, Palmeros-Suarez PA, Perier JD, Ramirez-Romero R, Roudine S, Sanches MM, Sachez-Garcia FJ, Signabon FB, van Baaren J, Vasquez C, Xu P, Lu Y, Elkahky M (2025) Biological control mitigates spread of vector-borne plant pathogens. *Agriculture, Ecosystems, and Environment* 388, 109683 **(3,4,6)**.
153. Zhu G, Ragozzino M, Holthouse MC, Mills M, Celis JL, Johnson S, **Crowder DW** (2025) Ecological niche modeling and potential dispersal of emerald ash borer in the Pacific Northwest. *Journal of Economic Entomology*, toaf175, https://doi.org/10.1093/jee/toaf175. (**1,2,6**)
152. Foutz JJ, Wagstaff C, Cooper WR, Swisher Grimm K, Angelella G, Wohleb CH, Waters TD, Oeller L **Crowder DW** (2025) Weeding them out: identifying noncrop hosts and sources of infectious beet leafhopper, *Neoaliturus tenellus* (Hemiptera: Cicadellidae), in the Columbia River Basin. *Annals of the Entomological Society of America*, saaf022. https://doi.org/10.1093/aesa/saaf022.
151. Lee BW, Basu S, Oeller L, Northfield TD, **Crowder DW** (2025) Predator niche overlap predicts effects on aphid vectors and a vector-borne virus. *Ecological Applications* 35, e70065. (**1,2,6**)
150. Onayemi SO, Rincon DF, Bahder BW, **Crowder DW**, Walsh DB (2025) Optimizing insecticide timings for the grape mealybug, *Pseudococcus maritimus* (Hemiptera: Pseudococcidae) based on pheromone trap capture data. *Journal of Economic Entomology* 118, 1188-1194. (**2,6**)
149. Rincon DF, McDonald IL, **Crowder DW*** (2025) Sequential testing of complementary hypotheses about population density. *Methods in Ecology and Evolution* 16, 1228-1238. **(2,6)**
148. Chisholm PJ, Charlton A, Anderson RM, Oeller L, Reganold JP, **Crowder DW*** (2025) Soil rhizobia promote plant yield by increasing plant tolerance to pests and pathogens under field conditions. *Agriculture, Ecosystems & Environment* 384, 109552. **(1,2,6)**
147. Oeller L, Lee B, Basu S, Murphy K, **Crowder DW*** (2025) Effects of organic and synthetic fertilizer on insect herbivore populations in quinoa. *Journal of Applied Entomology* 149, 515-523. (**1,2,6**)

146. Olsson RL, Pfeiffer VW, Lee BW, Oeller L, **Crowder DW*** (2025) Wild and managed bee communities in canola respond to landscape context and farm management. *Apidologie* 56, 51. (**1,2,6**)
145. Rincon DF, Gutierrez-Illan J, **Crowder DW*** (2025) Assessing pest control treatments from phenology models and field data. *Pest Management Science* 81, 1851-1859. (**2,6**)
144. Zhu G, Osorio-Olvera L, Pfeiffer V, Gutierrez Illan J, Neven JG, **Crowder DW*** (2025) Enhancing monitoring to promote early detection and eradication of invasive species. *Ecography* 2025, e07105. (**1,2,6**)
143. Bossert S, Freitas FV, Pauly A, Zhu G, **Crowder DW**, Orr MC, Dorey JB, Murray EA (2025) Phylogeny, antiquity, and niche occupancy of *Trinomia* (Hymenoptera: Halictidae), an Afrotropical endemic genus of Nomiinae. *Molecular Phylogenetics and Evolution* 204, 108273.
142. Wendlandt CE, Basu S, Montoya AP, Roberts P, Stewart JD, Coffin AB, **Crowder DW**, Kiers ET, Porter SS (2025) Managing friends and foes: sanctioning mutualists in mixed-infection nodules trades off with defense against antagonists. *Evolutionary Applications* 18, e70067. (**1,2,6**)
141. Zhu G, Illan JG, Hajek AE, Nielsen AL, Leskey TC, Walgenbach JF, Beers EH, **Crowder DW*** (2024) Assessing geographic dimensions of biological control for *Halyormopha halys* in United States. *Entomologia Generalis* 44, 895-904. **(1,2,6)**
140. Rincon DF, Esch ED, Gutierrez-Illan J, Teshe M, **Crowder DW*** (2024) Predicting insect population dynamics by linking phenology models and monitoring data. *Ecological Modelling* 493, 110763. (**1,2,6**)
139. Pfeiffer V, Basu S, **Crowder DW*** (2024) Patterns of virus coincidence between honey bees and bumble bees in the Pacific Northwest, USA. *Apidologie* 55, 30. **(2,6)**
138. Foutz JJ, Cooper WR, Swisher-Grimm K, **Crowder DW*** (2024) Seasonal and lifecycle changes in behavior affect the trapping efficiency of an insect vector, *Circulifer tenellus* (Hemiptera: Cicadellidae). *Annals of the Entomological Society of America* 117, 199-205. (**1,2,6**)
137. Rasmussen LV, Grass I, Mehrabi Z, Smith OM, Bezner-Kerr R, Blesh J, Garibaldi LA, Isaac ME, Kennedy CM, Wittman H, Batary P, Buchori B, Cerda R, Chara J, **Crowder DW**, Darras K, DeMaster K, Garcia K, Gomez M, Gonthier D, Hidayat P, Hipolito J, Hirons M, Hoey L, James D, John I, Jones AD, Karp DS, Kebede Y, Kerr CB, Klassen S, Kotowska M, Kreft H, Llanque R, Levers C, Lizcano DJ, Lu A, Madsen S, Marques RN, Martins PB, Melo A, Nyantakyi-Frimpong H, Olimpi EM, Owen JP, Pantevez H, Qaim M, Redlich S, Scherber C, Sciligo AR, Snapp S, Snyder WE, Steffan-Dewenter I, Stratton AE, Taylor JT, Tscharntke T, Valencia V, Vogel C, Kremen C (2024) Joint environmental and social benefits from diversified agriculture. *Science* 384, 87-93. **(3,6)**
136. Malhotra P, Basu S, Lee BW, Oeller L, **Crowder DW*** (2024) Effects of soil rhizobia abundance on interactions between a vector, pathogen, and legume plant host. *Genes* 15, 273. (**1,2,6**)
135. Bartel SL, Stephenson T, **Crowder DW***, Jones ME, Storfer A, Strickland MS, Lynch L (2024) Global change influences scavenging and carrion decomposition. *Trends in Ecology and Evolution,* 39, 152-164. (**1,2,6**)
134. Meyer MF, Brousil MR, Lee BW, Armstrong ML, Bloom EH, **Crowder DW*** (2024) Identifying drivers of sewage-associated pollutants in pollinators across urban landscapes. *Apidologie* 55, 3. **(2,6)**

133. Zhu G, Bush TN, Burgstahler KS, Green N, Cook H, Rampone E, Helmreich S, Reed RR, Milnes JM, **Crowder DW*** (2023) Estimating the potential distribution of yellow spotted stink bug (*Erthesina fullo*) using ecological niche models. *Entomological Science* 26, e12566. **(2,6)**
132. Pfeiffer V, **Crowder DW**, Silbernagel (2023) Urban development reduces bee abundance and diversity. *Urban Ecosystems* 26, 1535-1544. **(2,6)**
131. Lichtenberg EM, Milosavljevic I, Campbell AJ, **Crowder DW*** (2023) Differential effects of soil conservation practices on arthropods and crop yields. *Journal of Applied Entomology* 147, 931-940. (**1,2,6**)
130. Clark RE, Rincon DF, Wu Y, **Crowder DW***, Eigenbrode SD (2023) Experimental evidence reveals that vector host preference and performance across host plants is not altered by vector-borne plant viruses. *Frontiers in Ecology and Evolution* 11, 1251039. **(2,6)**
129. Robinson ML, Hahn PG, Inouye BD, Underwood N, Whitehead SR, Abbott KC, Bruna EM, Cacho NI, Dyer LA, Abdala-Roberts L, Allen WJ, Andrade JF, Angulo DF, Anjos D, Anstett DN, Bagchi R, Bagchi S, Barbosa M, Barrett S, Baskett CA, Ben-Simchon E, Bloodworth KJ, Bronstein JL, Buckley YM, Burghardt KT, Bustos-Segura C, Calixto ES, Carvalho RL, Castagneyrol B, Chiuffo MC, Cinolu D, Cinto Mejía E, Cock MC, Cogni R, Cope OL, Cornelissen T, Cortez DR, **Crowder DW**, Dallstream C, Dáttilo W, Davis JK, Dimarco RD, Dole HE, Egbon IN, Eisenring M, Ejomah A, Elderd BD, Endara MJ, Eubanks MD, Everingham SE, Farah KN, Farias RP, Fernandes AP, Fernandes GW, Ferrante M, Finn A, Florjancic GA, Forister ML, Fox QN, Frago E, França FM, Getman-Pickering AS, Getman-Pickering Z, Gianoli E, Gooden B, Gossner MM, Greig KA, Gripenberg S, Groenteman R, Grof-Tisza P, Haack N, Hahn L, Haq SM, Helms AM, Hennecke J, Hermann SL, Holeski LM, Holm S, Hutchinson MC, Jackson EE, Kagiya S, Kalske A, Kalwajtys M, Karban R, Kariyat R, Keasar T, Kersch-Becker MF, Kharouba HM, Kim TN, Kimuyu DM, Kluse J, Koerner SE, Komatsu KJ, Krishnan S, Laihonen M, Lamelas-López L, LaScaleia MC, Lecomte N, Lehn CR, Li X, Lindroth RL, LoPresti EF, Losada M, Louthan AM, Luizzi VJ, Lynch SC, Lynn JS, Lyon NJ, Maia LF, Maia RA, Mannall TL, Martin BS, Massad TJ, McCall AC, McGurrin K, Merwin AC, Mijango-Ramos Z, Mills CH, Moles AT, Moore CM, Moreira X, Morrison CR, Moshobane MC, Muola A, Nakadai R, Nakajima K, Novais S, Ogbebor CO, Ohsaki H, Pan VS, Pardikes NA, Pareja M, Parthasarathy N, Pawar RR, Paynter Q, Pearse IS, Penczykowski RM, Pepi AA, Pereira CC, Phartyal SS, Piper FI, Poveda K, Pringle EG, Puy J, Quijano T, Quintero C, Rasmann S, Rosche C, Rosenheim LY, Rosenheim JA, Runyon JB, Sadeh A, Sakata Y, Salcido DM, Salgado-Luarte C, Santos BA, Sapir Y, Sasal Y, Sato Y, Sawant M, Schroeder H, Schumann I, Segoli M, Segre H, Shelef O, Shinohara N, Singh RP, Smith DS, Sobral M, Stotz GC, Tack AJM, Tayal M, Tooker JF, Torrico-Bazoberry D, Tougeron K, Trowbridge AM, Utsumi S, Uyi O, Vaca-Uribe JL, Valtonen A, van Dijk LJA, Vandvik V, Villellas J, Waller LP, Weber MG, Yamawo A, Yim S, Zarnetske PL, Zehr LN, Zhong Z, Wetzel WC. Plant size, latitude, and phylogeny explain within-population variability in herbivory. *Science* 382, 679-683. **(3,6)**
128. Basu S, Moroz N, Lee BW, Tanaka K, Oeller L, Baerlocher CW, **Crowder DW*** (2023) Diversity and traits of multiple biotic stressors elicit differential defense responses in legumes. *Agriculture* 13, 2093. **(1,2,6)**

127. Jocson DMI, Gonzalez MT, Horton DR, Nottingham LB, Beers EH, **Crowder DW*** (2023) Characterizing substrate-based vibrational mating signals produced by pear psylla, *Cacopsylla pyricola* (Hemiptera: Psyllidae). *Journal of Insect Behavior* 36, 267-276. **(1,2,6)**
126. Bloom EH, Gutierrez Illan J, Brousil MR, Reganold JP, Northfield TD, **Crowder DW*** (2023) Long-term organic farming and floral diversity promotes stability of bee communities in agroecosystems. *Functional Ecology* 37, 2809-2825. **(1,2,6)**
125. Gimenez-Garcia A, Allen-Perkins A, Bartomeus I, Balbi S, Knapp JL, Hevia V, Woodcock BA, Smagghe G, Minarro M, Eeraerts M, Colville JF, Hipolito J, Cavigliasso P, Nates-Parra G, Herrera JM, Cusser S, Simmons BI, Wolters V, Jha S, Freitas BM, Horgan FG, Artz DR, Sidhu CS, Otieno M, Boreux V, Biddinger DJ, Klein A-M, Joshi NK, Stewart RIA, Albrecht M, Nicholson CC, O'Reilly AD, **Crowder DW**, Burns KLW, Jodar DNN, Garibaldi LA, Sutter L, Dupont YL, Dalsgaard B, da Encarnacao Coutinho JG, Lazaro A, Andersson GKS, Raine NE, Krishnan S, Dainese M, van der Werf W, Smith HG, Magrach A (2023) Pollination supply models from a local to global scale. *Web Ecology* 23, 99-129. **(2,6)**
124. Gorman CJ, **Crowder DW***, Swisher Grimm KD (2023) A high-throughput plate method for nucleic acid extraction from beet leafhopper (Hemiptera: Cicadellidae) and potato psyllid (Hemiptera: Trizoidae) for pathogen detection. *Journal of Economic Entomology* 5, 1876-1884. **(2,6)**
123. Jarugula S, Wagstaff C, Mitra A, **Crowder DW**, Gang D, Rayapati N (2023) First reports of beet curly top virus, Citrus yellow vein-associated virus, and Hop latent viroid in industrial hemp (*Cannabis sativa*) in Washington State. *Plant Disease* 107*,* 2897. (**2,6**)
122. Zhu G, Oeller LC, Wojahn R, Acosta C, Milnes JM, **Crowder DW*** (2023) Potential distribution and spread of Japanese beetle in Washington State*. Journal of Economic Entomology* 116, 1458-1463. **(1,2,6)**
121. Clark RE, Basu S, Eigenbrode SD, Oeller LC, **Crowder DW*** (2023) Risk assessment for non-crop hosts of pea enation mosaic virus and the aphid vector *Acyrthosiphon pisum. Agricultural and Forest Entomology* 25, 427-434. **(1,2,6)**
120. Lee BW, Oeller LC, **Crowder DW*** (2023) Integrating community ecology into models of vector-borne virus transmission. *Plants* 12, 2335. **(1,2,6)**
119. Donkersley P, Witchalls S, Bloom EH, **Crowder DW*** (2023) A little does a lot: can small-scale planting for pollinators make a difference? *Agriculture, Ecosystems, and Environment* 343, 108254. (**2,6**)
118. Schaeffer RN, **Crowder DW**, Illan JG, Beck JJ, Fukami T, Williams NM, Vannette RL (2023) Disease management during bloom affects the floral microbiome but not pollination in a mass-flowering crop. *Journal of Applied Ecology* 60, 64-76. (**6**)
117. Cohen A, Basu S, **Crowder DW*** (2023) Drought stress affects interactions between potato plants, psyllid vectors, and a bacterial pathogen. *FEMS Microbiology Ecology* 99, fiac142. **(1,2,6)**
116. Lee BW, Clark RE, Basu S, **Crowder DW*** (2022) Predators affect a plant virus through direct and trait-mediated indirect effects on vectors. *Food Webs* 33, e00251. (**1,2,6**)
115. Gutierrez Illan J, Zhu G, Walgenbach JF, Acebes-Doria A, Agnello AM, Alston DG, Andrews H, Beers EH, Bergh JC, Bessin RT, Blaauw BR, Buntin GD, Burkness EC, Cullum JP, Daane KM, Fann LE, Fisher J, Girod P, Gut LJ, Hamilton Gc, Helper JR, Hilton R, Hoelmer KA, Hutchison WD, Jentsch PJ, Joseph SV, Kennedy GG, Krawczyk

G, Kuhar TP, Lee JC, Leskey TCZ, Marshall AT, Milnes MJ, Nielsen AL, Patel DK, Peterson HD, Reisig DD, Rijal JP, Sial AA, Spears LR, Stahl JM, Tatman KM, Taylor SV, Tillman G, Toews MD, Villanueva RT, Welty C, Wiman NG, Wilson JK, Zalom FG, **Crowder DW*** (2022) Evaluating invasion risk and population dynamics of the brown marmorated stink bug across the contiguous United States. *Pest Management Science* 78, 4929-4938. (**1,2,6**)

114. Basu S, Lee BW, Clark RE, Bera S, Casteel CL, **Crowder DW*** (2022) Legume plant defenses and nutrients mediate indirect interactions between soil rhizobia and chewing herbivores. *Basic and Applied Ecology* 64, 57-67. (**1,2,6**)
113. Li J, Broussard M, Tomer N, Jochym M, Fonseka D, Peace A, Jesson L, Bosque-Perez NA, **Crowder DW**, Howlett B, Pattemore D (2022) Honey bee (*Apis mellifera*) hive placement is more influential than orchard layout on the fruit set of a dioecious crop. *Ecological Modelling* 472, 110074. (**5,6**)
112. Snyder GB, Smith OM, Chapman EG, Crossley MS, **Crowder DW**, Fu Z, Harwood JD, Jensen AS, Krey KL, Lynch CA, Snyder WE (2022) Alternate prey mediate intraguild predation in the open field. *Pest Management Science* 78, 3939-3946. (**6**)
111. Lynch CA, Smith OM, Chapman EG, Crossley MS, **Crowder DW**, Fu Z, Harwood JD, Jensen AS, Krey KL, Snyder GB, Snyder WE (2022) Alternative prey and farming system mediate predation of Colorado potato beetles by generalists. *Pest Management Science* 78, 3769-3777. (**6**)
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11. Tabashnik BE, Gassmann AJ, **Crowder DW**, Carrière Y (2008) Insect resistance to *Bt* crops: evidence versus theory. *Nature Biotechnology* 26, 199-202. (**4,6**)
10. **Crowder DW**, Dennehy TJ, Ellers-Kirk C, Yafuso C, Ellsworth PC, Tabashnik BE, Carrière Y (2007) Field evaluation of pyriproxyfen resistance in *Bemisia tabaci* (B biotype) *Journal of Economic Entomology* 100, 1650-1656. (**1,3,4,5,6**)
9. **Crowder DW** (2007) Impact of release rates on the effectiveness of augmentative biological control agents. *Journal of Insect Science* 7, 15. (**1,3,4,5,6**)
8. Onstad DW, Hibbard BE, Clark TL, **Crowder DW**, Carter KG (2006) Analysis of density-dependent survival of *Diabrotica* (Coleoptera: Chrysomelidae) in cornfields. *Environmental Entomology* 35, 1272-1278. (**4,6**)
7. **Crowder DW,** Carrière Y, Tabashnik BE, Ellsworth PC, Dennehy TJ (2006) Modeling evolution of resistance to pyriproxyfen by the sweet-potato whitefly (Homoptera: Aleyrodidae) *Journal of Economic Entomology* 99, 1396-1406. (**1,3,4,5,6**)

6. **Crowder DW**, Onstad DW, Gray ME (2006) Planting transgenic insecticidal crops based on economic thresholds: consequences for integrated pest management and insect resistance management. *Journal of Economic Entomology* 99, 899-907. **1,3,4,5,6**)
5. **Crowder DW**, Onstad DW, Gray ME, Mitchell PD, Spencer JL, Brazee RJ (2005) Economic analysis of dynamic management strategies utilizing transgenic corn for control of western corn rootworm (Coleoptera: Chrysomelidae) *Journal of Economic Entomology* 8, 961-975. (**1,3,4,5,6**)
4. **Crowder DW,** Onstad DW (2005) Using a generational time-step model to simulate the dynamics of adaptation to crop rotation and transgenic corn by western corn rootworm (Coleoptera: Chrysomelidae) *Journal of Economic Entomology* 98, 518-533. (**1,3,4,5,6**)
3. **Crowder DW**, Onstad DW, Gray ME, Pierce CMF, Hager AG, Ratcliffe ST, Steffey KL (2005) Analysis of the dynamics of adaptation to transgenic corn and crop rotation by western corn rootworm (Coleoptera: Chrysomelidae) using a daily time-step model. *Journal of Economic Entomology* 98, 534-551. (**1,3,4,5,6**)
2. Onstad DW, **Crowder DW**, Mitchell PD, Guse CA, Spencer JL, Levine E, Gray ME (2003) Economics versus alleles: balancing IPM and IRM for rotation-resistant western corn rootworm. *Journal of Economic Entomology* 96, 1872-1885. (**4,6**)
1. Onstad DW, **Crowder DW**, Isard SA, Levine E, Spencer JL, Bledsoe LW, O'Neil ME, Eisley JB, Gray ME, Ratcliffe SA, DiFonzo CD, Edwards CR (2003) Does landscape diversity affect the spread of the rotation-resistant western corn rootworm (Coleoptera: Chrysomelidae)? *Environmental Entomology* 32, 992-1001. (**4,6**)

## Book Chapters

* - Indicates senior authorship on book chapters written by my grad students or postdocs. None of these chapters were written during my tenure as an Associate Professor from 2018 to 2022.

Footnotes: (1) Developed the initial idea; (2) Obtained or provided funds/resources; (3) Collected data; (4) Analyzed Data; (5) Wrote/created publication; (6) Edited publication.

7. Eigenbrode S, Bechinski E, Bosque-Perez N, **Crowder DW**, Rashed A, Rondon S, Stokes B (2017) Insect management strategies. In *Advances in Dryland Farming in the Inland Pacific Northwest* (eds Yorgey G, Kruger C). Washington State University Extension, Pullman, WA, USA, pp 469-536. (**6**)
6. Bloom EH, **Crowder DW** (2016) Biological control and pollination services on organic farms. In *Advances in Insect Control and Resistance Management* (eds Horowitz AR, Ishaaya I). Springer, New York, USA, pp 27-46. (**1,2,5,6**)
5. Eigenbrode SD, Davis TS, **Crowder DW** (2015) Climate change and biological control in agricultural systems: principles and examples from North America. In *Climate Change and Insect Pests* (eds Björkman C, Niemelä P). CABI, Oxford, UK, pp 119-135. (**1,5,6**)
4. **Crowder D**, Ellsworth P, Naranjo S, Tabashnik B, Carrière Y (2013) Modeling resistance to juvenile hormone analogs: linking evolution, ecology, and management. In *Juvenile Hormones and Juvenoids: Modeling Biological Effects and Environmental Fate* (ed Devillers J). CRC Press, Boca Raton, FL, USA, pp 99-126. (**1,3,4,5,6**)
3. Northfield TD, **Crowder DW**, Jabbour R, Snyder WE (2013) Natural enemy functional identity and biological control. In *Ecology and Evolution of Trait-Mediated Indirect*

*Interactions: Linking Evolution, Community, and Ecosystem.* (eds Ohgushi T, Schmitz O, Holt RD). Cambridge University Press, Cambridge, UK, pp 450-465. (**1,6**)

2. Lynch CA, **Crowder DW**, Jabbour R, Snyder WE (2012) Spud web: species interactions and biodiversity in potatoes. In *Insect Pests of Potato: Global Perspectives on Biology and Management* (eds Giordanengo P, Vincent C, Alyokhin A). Elsevier, Oxford, UK, pp 271-290. (**6**)
1. Onstad DW, Guse CA, **Crowder DW** (2004) Heterogeneous landscapes and variable behavior: modeling rootworm evolution and geographic spread. In *Western Corn Rootworm: Ecology and Management* (eds Vidal S, Kulhmann U, Edwards CR). CAB Publishing, Wallingford, UK, pp 155-167. (**3,4,5,6**)

## Extension Publications

* - Indicates senior authorship on extension articles written by my grad students or postdocs

Footnotes: (1) Developed the initial idea; (2) Obtained or provided funds/resources; (3) Collected data; (4) Analyzed Data; (5) Wrote/created publication; (6) Edited publication.

16. Helmreich S, Melathopoulous A, Little Z, Chabert S, Milbraith MO, Malinger RE, Walters J, Goldstein L, Isaacs R, Galinato SP, Kogan C, Rogers E, Brouwer K, Eeraerts M, Naranjo S, **Crowder DW**, DeVetter LW (2025) Blossoming success: best practices for northern highbush blueberry pollination. Washington State University Extension, 30 pp.
15. Olsson RL, Sowers K, **Crowder DW** (2021) Pollinators in canola in the Inland Pacific Northwest. Washington State University Extension PNW751, 14 pp. (**1,2,5,6**)
14. Horton DR, Cooper WR, Swisher Grimm K, **Crowder DW**, Fu Z, Waters T, Wohleb C, Frost K, Jensen A, Blua M (2018) The beet leafhopper odyssey in North America: a brief overview. Potato Progress XVIII, 16. (**6**)
13. Bloom EH, Olsson RL, Wine EH, Schaeffer RN, **Crowder DW** (2018) Managing cavity-nesting wild bees in Western Washington. Washington State University Extension, FS293E, 8 pp. (**1,2,5,6**)
12. Misiewicz T, Shade J, **Crowder DW**, Delate K, Sciligo A, Silva E (2017) Increasing agricultural sustainability through organic farming: outcomes from the Organic Confluences Summit. The Organic Center, Washington DC, USA. **(2,6)**
11. Bloom EH, Olsson RL, **Crowder DW** (2017) A citizen science guide to wild bees and floral visitors in western Washington. Washington State University Extension, EM110E, 17 pp. (**1,2,5,6**)
10. Rondon SI, Vinchesi A, Rashed A, **Crowder DW** (2017) Wireworms: a pest of monumental proportions. Oregon State University Extension Service, EM9166, 5 pp. (**1,5,6**)
9. Horton DR, Thinakaran J, Cooper WR, Munyaneza JE, Wohleb C, Waters T, Snyder W, Fu Z, **Crowder DW**, Jensen A (2016) Matrimony vine and potato psyllid in the Pacific Northwest: a worrisome marriage? *Potato Progress* 16:14. (**6**)
8. Milosavljevic I, Esser A, **Crowder DW** (2015) Identifying wireworms in cereal crops. Washington State University Extension, FS175E, 6 pp. (**1,2,5,6**)
7. Tabashnik B, **Crowder DW**, Carrière Y, Gassmann A, Masson L, Bravo A, Soberon M (2009) Bt resistance management mambos nos. 1 and 2. In *Society for Invertebrate Pathology Newsletter*, pp. 9-10. (**6**)

6. **Crowder DW,** Ellers-Kirk C, Dennehy T, Tabashnik B, Carrière Y (2008) Genetics and management of whitefly resistance to pyriproxyfen. In *Resistant Pest Management Newsletter*, pp. 52-53. (**3,4,5,6)**
5. Tabashnik BE, **Crowder DW,** Carrière Y (2008) Modeling evolution of insect resistance to genetically modified crops. *Nature Protocols Network*. http://www.natureprotocols.com/2008/06/19/modeling_evolution_of_insect_r.php. (**6)**
4. Tabashnik BE, Gassmann AJ, **Crowder DW**, Carrière Y (2008) Field-evolved insect resistance to transgenic *Bt* crops. In *Information Systems for Biotechnology News Report*, pp. 1-5. (**6)**
3. Dennehy TJ, Degain B, Harpold G, Li X, **Crowder DW**, Carrière Y, Ellsworth PC, Nichols RL (2008) Management of *Bemisia* resistance: cotton in the southwestern USA. *Journal of Insect Science* 8:04. (**3,4,5,6)**
2. **Crowder DW,** Ellsworth P, Dennehy T, Tabashnik B, Carrière Y (2007) Impact of operational factors on the evolution of resistance to pyriproxyfen in the sweetpotato whitefly. In *Resistant Pest Management Newsletter*, pp. 27. (**1,3,4,5,6)**
1. Goertz D, Onstad D, **Crowder DW**, Linde A (2003) Modellierung des einflusses von insektenpathogenen (mikrosporidien) auf die populationsdynamik eines Forstschädlings, *Lymantria dispar* L. *Mitteilungen der Deutschen Gesellschaft fur Allgemeine und Angewandte Entomologie* 14, 245-248. (**6**)

## Software Packages

2. Rincon DF, McCabe I, **Crowder DW** (2025) sequential.pops: sequential analysis of biological population sizes. R package, DOI: 10.32614/CRAN.package.sequential.pops. https://CRAN.R-project.org/package=sequential.pops.
1. Zhu G, Osorio-Olvera L, Gutierrez Illan J, **Crowder DW** (2025) enmRoute – Ecological niche models for sampling route optimization. https://github.com/gpzhu/enmRoute.

## Teaching Experience

### Instructor, Washington State University

2015-2019 *Statistics 511 - Experimental Design and Data Analysis.* Graduate course focused on experimental design and statistics using *R*. Offered every Fall (5 times).

2014 *Entomology 593 – Insect Behavior.* Graduate seminar focused on insect behavior.

2013-present *Entomology 511 – Science Writing.* Graduate course focused on techniques for writing grants and manuscripts. Offered every Spring except for 2020 when on sabbatical (12 times).

2013-2015 *Entomology 351 – Ecological and Integrated Pest Management.* Undergraduate course focused on ecological and integrated pest management. Offered in fall 2013 and spring 2015.

2013 *Entomology 150 – Insects, Science, and World Cultures*. Co-instructor w/ L. Lavine. Undergraduate course focused on impacts of insects on humans.

### Teaching Assistant, University of Arizona

2008 *Entomology 613 - Applied Biostatistics*. Assisted students during lab sessions and graded homework assignments. Professors: Yves Carrière and Bob Steidl.

## Invited Presentations

96. **Crowder DW** (2025) Building a collaborative network to support research capacity in digital agriculture. California Almond Growers Field Day, Fresno, CA.
95. **Crowder DW** (2025) Building a collaborative network to support research capacity in digital agriculture. California Pistachio Growers Field Day, Fresno, CA.
94. Sugden E, Peterman W, Anderson R, **Crowder DW** (2025) Structure of bee communities in marginal lands of the Puget Sound, USA. SCARABS Society, Seattle, WA.
93. **Crowder DW** (2025) Linking regional monitoring with molecular ecology to assess dynamics of vector-borne plant pathogens. Washington State University Plant Pathology Seminar Series.
92. **Crowder DW** (2024) Introduction to insect biodiversity and ecology. Washington State University Cougar Kids Camp, Pullman, WA.
91. **Crowder DW** (2024) Working with growers on integrated pest management using digital tools. Cornell University Scaffolds Podcast, Cornell, WA.
90. **Crowder DW** (2024) Expanding the WSU Decision Aid System into small grains. WSU Small Grains Team Annual Meeting, Pullman, WA.
89. **Crowder DW** (2024) Effects of rhizobia on winter pea tolerance to aphids and pathogens. Pacific Northwest Pulse Crop Working Group, Pullman, WA.
88. **Crowder DW**, Khot L (2024) Upgrades to WSU Decision Aid System and Ag Weather Network. Washington Tree Fruit Research Commission Annual Crop Protection Research Review, Wenatchee, WA.
87. **Crowder DW**, Szendrei Z, Groves R, Goldberger J (2024) Enhancing IPM for US potato production systems. Potato Expo Annual Meeting, Austin, TX.
86. **Crowder DW** (2023) Modeling habitat suitability for brown marmorated stink bug. Almond Board of California Research Coordination Meeting, Sacramento, CA.
85. **Crowder DW** (2023) Role of agricultural intensification on biodiversity and ecosystem function. Swedish University of Agricultural Sciences, Uppsala, Sweden.
84. **Crowder DW** (2023) Linking big data with ecological models to inform decision making in agricultural ecosystems. Swedish University of Agricultural Sciences, Uppsala, Sweden.
83. **Crowder DW**, Zhu G (2023) Modeling habitat suitability for Northern giant hornet. Northern Giant Hornet National Research Coordination Meeting, Seattle, WA.
82. **Crowder DW** (2022) The WSU Decision Aid System. Northwest Horticultural Expo, Wenatchee, WA.
81. **Crowder DW** (2022) Comparing codling moth phenology and ecology. Codling Moth Summit, Virtual Meeting.
80. **Crowder DW** (2021) Using digital tools to aid in invasive species management. Washington State Invasive Species Council, Virtual Meeting.
79. **Crowder DW** (2021) Using digital tools to aid in sustainable pest management. Washington State University Master Gardeners Conference, Virtual Meeting.
78. **Crowder DW** (2021) Biodiversity of bees across an urban to rural gradient. Iowa State University, Ames, IA.
77. **Crowder DW** (2021) Codling moth: comparing phenology and ecology. Codling Moth Task Force Meeting, Virtual Meeting.
76. Smith O, Cohen A, Reganold J, Jones M, Orpet R, Taylor J, Thurman J, Cornell K, Olsson R, Ge Y, Kennedy C, **Crowder DW** (2020) Landscape context affects the sustainability of

organic farming systems. Annual Meeting of the Entomological Society of America, Virtual Meeting.

75. **Crowder DW** (2020) Community-wide interactions affect an aphid-borne pathogen. University of California Riverside, Riverside, CA.
74. **Crowder DW** (2020) Biodiversity of bees across an urban to rural gradient. University of Saskatoon, Saskatoon, Canada.
73. **Crowder DW** (2020) Community-wide interactions affect an aphid-borne pathogen. Iowa State University, Ames, IA.
72. **Crowder DW** (2020) Community-wide interactions affect an aphid-borne pathogen Kansas State University, Manhattan, KS.
71. **Crowder DW** (2020) Building a Decision Support System for Potato Crops. WA-OR Potato Conference, Kennewick, WA
70. **Crowder DW** (2019) Untangling the epidemiological web in legume crops. University of Missouri Department of Plant Sciences, Columbia, MO
69. **Crowder DW** (2019) Untangling the epidemiological web in legume crops. Oregon State University Department of Biomedical Sciences, Corvallis, OR
68. **Crowder DW** (2019) Untangling the epidemiological web in legume crops, Washington State University Molecular Plant Sciences Symposium.
67. Beers E, Athey K, Northfield T, **Crowder DW**, Brunner J (2019) Everything old is new again: codling moth SIR in Washington State. Annual Meeting of the Entomological Society of America, St. Louis, MO.
66. **Crowder DW** (2018) Examining factors mediating transmission of aphid-borne viruses in legume crops. Western Pulse Association Annual Meeting, Moscow, ID.
65. **Crowder DW** (2018) Plant-mediated indirect interactions between weevils and aphids promotes the spread of a plant virus. Annual Meeting of the Entomological Society of America, Vancouver, Canada.
64. **Crowder DW**, Whaley D (2018) Identifying and managing insect pests on the farm. Washington Wheat Academy, Pullman, WA.
63. **Crowder DW** (2018) Untangling the epidemiological web: food web influences on the spread of a vector-borne plant virus. University of Georgia Department of Entomology Seminar Series, Athens, GA.
62. **Crowder DW** (2018) Untangling the epidemiological web: food web influences on the spread of a vector-borne plant virus. Washington State University Department of Plant Pathology Seminar Series, Pullman, WA.
61. **Crowder DW** (2018) Plant-insect interactions in Pacific Northwest Agroecosystems. Gonzaga University Department of Biology Seminar Series, Spokane, WA.
60. **Crowder DW**, Whaley D (2017) Identifying and managing insect pests on the farm. Washington Wheat Academy, Pullman, WA.
59. **Crowder DW**, Esser A, Higginbotham R (2017) Design, analysis, and interpretation of research trials. Washington Wheat Academy, Pullman, WA.
58. **Crowder DW** (2017) Effects of land-use on pollinators and natural enemies and associated ecosystem services: Insights from field experiments and a meta-analysis. Annual Meeting of the Entomological Society of America, Denver, CO.
57. Wohleb C, Waters TD, **Crowder DW** (2017) Decision support for potato growers using a pest monitoring network. Annual Meeting of the Potato Association of America, Fargo, ND.

56. **Crowder DW** (2017) Examining pollinator communities in diversified organic farms along an urbanization gradient. Annual Meeting of the Pacific Branch of the Entomological Society of America, Portland, OR.
55. **Crowder DW** (2016) Untangling the epidemiological web: community influences on the spread of an insect-vectored plant virus. Ohio State University, Department of Entomology, Columbus, OH.
54. **Crowder DW** (2016) Factors affecting movement of arthropods that transmit plant pathogens and implications for pathogen spread. International Congress of Entomology, Orlando, FL.
53. **Crowder DW** (2016) Biodiversity in organic farming systems. Organic Confluences Summit, Washington, DC.
52. **Crowder DW** (2016) Climate change and insect pests. Washington State University Pesticide Certification Course, Spokane, WA.
51. **Crowder DW** (2016) Climate change and insect pests. Washington State University Pesticide Certification Course, Wenatchee, WA.
50. **Crowder DW** (2016) Untangling the epidemiological web: community influences on the spread of an insect-vectored plant virus. University of California Davis, Department of Plant Pathology, Davis, CA.
49. **Crowder DW** (2016) Untangling the epidemiological web: community influences on the spread of an insect-vectored plant virus. University of Arkansas, Department of Entomology, Fayetteville, AR.
48. **Crowder DW** (2015) Evaluating and augmenting pollinator communities in diversified organic farming systems. Annual Meeting of the ASA/CSS/SSS, Minneapolis, MN.
47. Reganold J, **Crowder DW** (2015) Moving agriculture toward sustainability in the 21st century. Annual Meeting of the ASA/CSS/SSS, Minneapolis, MN.
46. **Crowder DW** (2015) Promoting biodiversity and functional agroecosystems at local and landscape scales. Annual Meeting of the Entomological Society of America, Minneapolis, MN.
45. **Crowder DW**, Chisholm P (2015) Impact of herbivory by a non-vector on the spread of a plant pathogen. Annual Meeting of the Pacific Branch of the Entomological Society of America, Couer d'Alene, ID.
44. **Crowder DW** (2014) Effects of insect community structure on the spread of plant diseases. Washington State University, School of Biological Sciences, Pullman, WA.
43. **Crowder DW** (2014) Ecology and management of wireworms in cereal crops. Washington State University Pesticide Recertification Training Program, Walla Walla, WA.
42. **Crowder DW,** Esser A (2014) Ecology and management of wireworms in cereal crops. Washington State University Wheat Academy, Pullman, WA.
41. **Crowder DW**, Dykstra E, Owen J (2014) Tradeoffs between agricultural intensification and insect-transmitted disease. Annual Meeting of the Entomological Society of America, Portland, OR.
40. Snyder WE, **Crowder DW**, Northfield TD, Gomulkiewicz R (2012) Conserving and promoting evenness: organic farming and fire-based wildland management as case studies. Annual Meeting of the Ecological Society of America, Portland, OR.
39. Esser AD, **Crowder DW**, Milosavljević I (2014) Controlling wireworms. Annual Meeting of the Entomological Society of America, Portland, OR.

38. Esser AD, Milosavljević I, **Crowder DW** (2014) Managing wireworms in Washington state's cereal grain systems. European Congress of Entomology, York, UK.
37. **Crowder DW** (2014) Effects of land-use on the incidence of West Nile virus in the Pacific Northwestern USA. Annual Meeting of the Pacific Branch of the Entomological Society of America, Tucson, AZ.
36. **Crowder DW** (2014) Regional effects of farming practices and crop landscapes on insect biodiversity and community structure. Annual Meeting of the Pacific Branch of the Entomological Society of America, Tucson, AZ.
35. **Crowder DW** (2013) Indirect effects of herbivory on predator-prey interactions. Annual Meeting of the Entomological Society of America, Austin, TX.
34. **Crowder DW** (2013) Effects of climate change on insect biodiversity across farming landscapes. Annual Meeting of the Pacific Branch of the Entomological Society of America, Lake Tahoe, NV.
33. Esser A, Pike K, Esser A, **Crowder DW** (2013) Controlling wireworms in cereal grain production in Washington State. Annual Meeting of the Pacific Branch of the Entomological Society of America, Lake Tahoe, NV.
32. **Crowder DW** (2013) Effects of climate and farming systems on insect biodiversity and ecosystem services. University of Kentucky, Department of Entomology, Lexington, KY.
31. **Crowder DW** (2012) Effects of climate change on insect communities across variable crop landscapes. Annual Meeting of the Entomological Society of America, Knoxville, TN.
30. Owen J, Snyder W, Meadows A, **Crowder DW** (2012) Looking for the devil in the details of West Nile virus transmission. Palouse Ecologists, Evolutionary Biologists, and Systematists, Moscow, ID.
29. **Crowder DW,** Horowitz R, Carrière (2012) Effects of behavior and habitat use on the spread and impact of invasive herbivores. International Congress of Entomology, Daegu, South Korea.
28. **Crowder DW**, Gable J, Northfield T, Steffan S, Snyder W (2012) Niche engineering reveals complementary resource use among predators. International Congress of Entomology, Daegu, South Korea.
27. **Crowder DW**, Snyder WE (2012) Get rich or get even? Linking biodiversity and natural pest control. International Congress of Entomology, Daegu, South Korea.
26. **Crowder DW** (2011) Get rich or get even? Linking predator biodiversity with prey suppression. Miami University, Department of Zoology, Oxford, OH.
25. **Crowder DW** (2011) Using beneficial nematodes for biological control. Natural Pest Management Field Day, Green Trees Natural Farm, Sand Pointe, ID.
24. **Crowder DW** (2011) Landscape-level effects on beneficial predators and pests in potato systems. Washington State University Potato Field Day, Othello, WA.
23. **Crowder DW** (2011) Exploring the effects of behavior on the spread and impact of invasive insects. Annual Meeting of the Entomological Society of America, Reno, NV.
22. Owen J, Scoles GA, **Crowder DW** (2010) Exploring ecological immunology of the Rocky Mountain wood tick (*Dermacentor andersoni*). Annual Meeting of the Entomological Society of America, San Diego, CA.
21. **Crowder DW** (2010) Biological control of pests in potato crops. Washington State University Potato Field Day, Othello, WA.
20. **Crowder DW** (2010) Get rich or get even? Linking predator biodiversity with prey suppression. Palouse Ecologists, Evolutionary Biologists, and Systematists, Pullman, WA.

19. **Crowder DW** (2009) Interspecific competition and displacement between whiteflies: theory meets data. Zhejiang University, Institute of Applied Entomology, Hangzhou, China.
18. **Crowder DW**, Horowitz AR, De Barro P, Liu S-S, Carrière Y (2009) Predicting competitive displacement between whiteflies: linking theory with data. International *Bemisia* Workshop, Guangzhou, China.
17. Liu S-S, De Barro P, **Crowder DW** (2009) Behavioural mechanisms underlying competitive displacement in animal invasions (keynote speech). International Congress on Biological Invasions, Fuzhou, China.
16. Tabashnik B, **Crowder DW**, Carrière Y, Gassmann A, Masson L, Bravo A, Soberon M (2009) Bt resistance management mambos nos. 1 and 2 (keynote speech). Annual Meeting of the Society for Invertebrate Pathology, Salt Lake City, UT.
15. **Crowder DW,** Sitvarin MI, Carrière Y (2008) Behavioral plasticity drives competitive displacement by an invasive whitefly. Center for Insect Science Hexapodium, Tucson, AZ.
14. Tabashnik B, Gassmann A, **Crowder DW,** Carrière Y (2008) GMOs: Silver Bullet? Annual Meeting of the Entomological Society of America, Reno, NV.
13. **Crowder DW** (2008) Genetics and management of insecticide resistance in whiteflies. United States Arid Lands Agricultural Research Center Seminar Series, Maricopa, AZ.
12. Tabashnik BE, Gassmann AJ, **Crowder DW**, Carrière Y (2008) Transgenic crops, pest resistance, and outbreaks. International Congress of Entomology, Durban, South Africa.
11. Gray ME, **Crowder DW**, Onstad DW (2008) The relevance of economic thresholds in transgenic corn: Does IPM affect IRM? International Congress of Entomology, Durban, South Africa.
10. **Crowder DW** (2008) Understanding and managing pyriproxyfen resistance in whiteflies. Arizona Early Season Cotton Management Meeting, Marana, AZ.
9. Tabashnik BE, Gassmann AJ, **Crowder DW**, Carrière Y (2007) Insect resistance to Bt crops: evidence versus theory. Annual Meeting of the Entomological Society of America, San Diego, CA.
8. Dennehy TJ, DeGain B, Harpold G, Li X, **Crowder DW**, Carrière Y, Ellsworth PC, Nichols RL (2006) Management of *Bemisia* resistance: cotton in the southwestern USA. 4th International Bemisia Workshop, Duck Key, FL, USA.
7. **Crowder DW** (2006) Pesticide resistance in a haplodiploid insect. University of Arizona Department of Entomology Seminar Series, Tucson, AZ.
6. **Crowder DW** (2005) Understanding and managing agricultural pests: simulated analysis. University of Arizona Department of Entomology Seminar Series, Tucson, AZ.
5. Onstad DW, **Crowder DW** (2004) The latest biological and economic results from simulations of the western corn rootworm variant models. Annual Meeting of the North-Central Branch of the Entomological Society of America, Kansas City, MO, USA.
4. Onstad DW, **Crowder DW**, Huang Z (2003) Modeling *Nosema* disease in honeybee colonies. Annual Meeting of the Society for Invertebrate Pathology, Burlington, VT.
3. Guse CA, Onstad DW, **Crowder DW** (2005) The future of insect resistance management: balancing ecology, evolution and economics to determine best management practices. Illinois Crop Protection Technology Conference, Urbana, IL.
2. Guse CA, **Crowder DW**, Onstad DW (2004) Transgenic corn and rootworm: ecology, evolution and management. International Congress of Entomology, Brisbane, Australia.

1. **Crowder DW**, Onstad DW, Guse CA, Mitchell P (2003) Understanding and managing the rotation-resistant western corn rootworm: simulated analysis. Annual Meeting of the North Central Branch of the Entomological Society of America, Madison, WI.

## Invited Presentations by Members of Crowder Laboratory

75. Helmreich SL, DeVetter L, **Crowder DW** (2024) Beyond honey bees: building resilient pollination in blueberry. Lynden Agricultural Show, Lynden, WA.
74. Rampone E, Rincon D, **Crowder DW** (2024) Predicting pest population dynamics in Washington potatoes. Entomological Society of America Annual Meeting, Phoenix, AZ.
73. Rincon D, **Crowder DW** (2024) Linking phenology models and monitoring data to improve planning of pest management programs. Entomological Society of America Annual Meeting, Phoenix, AZ.
72. Rincon D, **Crowder DW** (2024) Area-wide pest management: integrating pest metapopulation dynamics and farmers' insight. 5th International Workshop on Biological Control, Mexico City, Mexico.
71. Macon T, **Crowder DW (**2024) Assessing honey bee pathogens using eDNA. Washington State University Entomology Seminar Series, Pullman, WA.
70. Macon T, **Crowder DW (**2024) Assessing honey bee pathogens using eDNA. Washington State University Entomology Seminar Series, Pullman, WA.
69. Wagstaff C, **Crowder DW** (2024) Assessing seasonal host use and pathogen transmission by beet leafhopper (*Circulifer tenellus*) in vegetable and hemp crop systems. Western Region Multi-State Project Meeting, Ft. Collins, CO.
68. Wagstaff C, **Crowder DW** (2024) Assessing seasonal host use and pathogen transmission by beet leafhopper (*Circulifer tenellus*) in the Columbia Basin. WSU Potato Field Day, Othello, WA.
67. Wagstaff C, **Crowder DW** (2024) Assessing seasonal host use and pathogen transmission by beet leafhopper (*Circulifer tenellus*) in vegetable and hemp crop systems. WSU Cannabis Research Seminar Series, Pullman, WA.
66. Wagstaff C, **Crowder DW** (2024) Assessing seasonal host use and pathogen transmission by beet leafhopper (*Circulifer tenellus*) in vegetable and hemp crop systems. 8th Annual Cannabis Research Conference, Ft. Collins, CO.
65. Wagstaff C, **Crowder DW** (2024) Assessing seasonal host use and pathogen transmission by beet leafhopper (*Circulifer tenellus*) in vegetable and hemp crop systems. Seattle Gardener's Club Annual Meeting, Seattle, WA.
64. Rampone EA, Rincon D, **Crowder DW** (2024) Predicting pest population dynamics in Washington potatoes. Entomological Society of America Annual Meeting, Phoenix, AZ.
63. Rincon D, **Crowder DW** (2024) Linking phenology models and monitoring data to improve planning of pest management programs. Entomological Society of America Annual Meeting, Phoenix, AZ.
62. Garcia-Carrasco JM, Poh K, Ueti M, **Crowder DW**, Mosqueda J, Gutierrez-Ilan J (2024) Mapping tick-borne disease risks in cattle: a preliminary database for predictive models in North America. 5th International Symposium of Ticks and the Diseases they Transmit, University of Queretaro, Queretaro, Mexico.
61. Macon T, **Crowder DW**, Hopkins B **(**2023) Assessing honey bee pathogens using eDNA. Washington State University Entomology Seminar Series, Pullman, WA.

60. Helmreich SA, **Crowder DW**, Devetter L (2023) Backyards, bees, and blueberries: the whys and hows to pollinator promotion. Comox Valley Horticultural Society, Courtenay, British Columbia.
59. Helmreich SA, **Crowder DW**, Devetter L (2023) Beyond honey bees, building resilient pollination in blueberry. Washington Small Fruit Conference, Lyndon, WA.
58. Helmreich SA, **Crowder DW**, Devetter L (2023) What's the buzz? Supporting our local PNW pollinators. Puyallup Bee City Pollinator Week, Puyallup, WA.
57. Jocson D, **Crowder DW** (2023) Biotremology in integrated pest management. Entomological Society of America Annual Meeting, National Harbor, MD.
56. Lynch L, Bartel SL, **Crowder DW**, Stephenson T, Mathias J, Hudiburg T (2023) Do scavenger declines alter ecosystem function? Malcolm Renfrew Interdisciplinary Colloquium, University of Idaho, Moscow, ID.
55. Jocson D, Gonzales M, Beers E, Horton DR, **Crowder DW** (2022) Potential use of acoustic communication for pear psylla IPM. Annual Meeting of the Pacific Branch of the Entomological Society of America, Santa Rosa, CA.
54. Cohen A, Illan JG, Pfeiffer V, Wohleb C, **Crowder DW** (2021) Lining up at the buffet: how water stress and host choice interact with intensified landscapes. Annual Meeting of the Entomological Society of America, Denver, CO.
53. Basu S, **Crowder DW** (2021) Assessing complex plant-mediated interactions among pea aphid vectors and legume crops. Annual Meeting of the Pacific Branch of the Entomological Society of America, Virtual Meeting.
52. Cohen A, Illan J, **Crowder DW** (2020) Pest forecasting in potatoes: successes and challenges. Annual Meeting of the Pacific Branch of the Entomological Society of America, Spokane, WA.
51. Clark R, **Crowder DW** (2020) Can monitoring alternative host plants improve the accuracy of landscape-scale outbreak models? Insights from dryland agriculture. Annual Meeting of the Pacific Branch of the Entomological Society of America, Spokane, WA.
50. Illan J, Walgenbach J, Beers E, **Crowder DW** (2020) Evaluating the risk of invasion and population dynamics of the brown marmorated stink bug (*Halyomorpha halys*) in the USA. Annual Meeting of the Pacific Branch of the Entomological Society of America, Spokane, WA.
49. Jocson D, **Crowder DW**, Beers E, Horton DR (2020) Mating behavior of *Cacopsylla pyricola*: understanding the vibrational communication of an important pear pest. Annual Meeting of the Pacific Branch of the Entomological Society of America, Spokane, WA.
48. Basu S, Clark R, Blundell R, Casteel C, **Crowder DW** (2020) Reciprocal antagonism between a plant virus and rhizobial bacteria. Annual Meeting of the Pacific Branch of the Entomological Society of America, Spokane, WA.
47. Jocson D, Beers E, Crowder DW (2020) Acoustic mating disruption of pear psylla. North Central Washington Pear Day, Wenatchee, WA
46. Clark R, **Crowder DW** (2018) Generalized linear mixed models for ecological datasets using LME4 in R. Northwest Scientific Association Annual Meeting. Olympia, WA.
45. Olsson R, **Crowder DW** (2018) The canola pollinator relationship. Western Oilseed Cropping Systems Field Day, Colfax, WA.
44. Olsson R, **Crowder DW** (2018) The canola pollinator relationship. Western Oilseed Cropping Systems Field Day, Ritzville, WA.

43. Olsson R, **Crowder DW** (2018) The canola pollinator relationship. Western Oilseed Cropping Systems Field Day, Richland, WA.
42. Bloom EH, Schaeffer RN, Olsson RL, **Crowder DW** (2018) Researcher led field day. Beacon Food Forest. Seattle, WA.
41. Bloom EH, **Crowder DW** (2018) An introduction to your cavity-nesting bees. Koppel Community Garden. Pullman, WA.
40. Eggleston LE, Bloom EH, Olsson RL, Brousil MR, **Crowder DW** (2018) Introduced pollinators may indirectly reduce native pollinator competition. Student Undergraduate Researcher Competition and Awards. Pullman, WA.
39. Orpet RJ, Jones V, **Crowder DW** (2018) What soil sociology, DNA evidence, and earwigs have to do with an apple pest, the woolly apple aphid. Science in our Valley Seminar Series, Wenatchee, WA.
38. Orpet RJ, **Crowder DW**, Jones V (2018) Woolly apple aphid control. Chelan Fruit Company Hort Day, Okonagan, WA.
37. Orpet, RJ, **Crowder DW**, Jones V (2018) Getting to know European earwig. Science in Our Valley Seminar Series, Wenatchee, WA.
36. Orpet RJ, **Crowder DW**, Jones VP (2017) Woolly apple aphids. WSU Extension Tree Fruit Team Organic Pest and Disease Management School, Wenatchee, WA.
35. Orpet RJ, **Crowder DW**, Jones VP (2017) Woolly apple aphid risk factors. Okanogan Hort Day, Okanagon, WA.
34. Orpet RJ, **Crowder DW**, Jones VP (2017) Woolly apple aphid risk factors. North Central Washington 'Apple Day', Wenatchee, WA.
33. Milosavljevic I, Esser A, **Crowder DW** (2016). Wireworm research update: from conventional to contemporary management. Washington Association of Wheat Growers Wheat College. Davenport, WA.
32. Bloom E, **Crowder DW** (2016) Challenging Assumptions with Bee Monitoring in the Puget Sound Region. Kiwanis Club of America, Seattle, WA.
31. Bloom E, **Crowder DW** (2016) Pollinators in Organic Farms and Urban Areas. Washington State University Urban IPM and Pesticide Safety Education, Puyallup, WA
30. Bloom E, **Crowder DW** (2016) Can Pollinator Monitoring Inform Wild Bee Conservation. Seattle Parks and Recreation, Seattle, WA.
29. Bloom E, **Crowder DW** (2016) Advances in organic farming. International Congress of Entomology, Orlando, FL.
28. Milosavljevic I, Esser A, **Crowder DW** (2016) Biology, ecology, and control of wireworms in cereal crops. International Congress of Entomology, Orlando, FL.
27. Milosavljevic I, Esser A, **Crowder DW** (2016) Entomophagous organisms can significantly suppress wireworms in wheat. Pacific Branch of the Entomological Society of America Annual Meeting, Honolulu, HI.
26. Orpet R, Beers E, Reganold J, Goldberger J, Jones V, **Crowder DW** (2015) Dynamics of woolly apple aphid, *Eriosoma lanigerum*, in organic and conventional Washington apple orchards. Annual Meeting of the Entomological Society of America, Minneapolis, MN.
25. Bloom E, **Crowder DW** (2015) Current research in alternative pollination systems. Tuesday at 21, 21 Acres Farm, Woodinville WA.
24. Bloom E, **Crowder DW** (2015) Bee monitoring and restoration in the Puget sound region – research and science to "save the bees". Ravenna Eckstein Community Center, Seattle, WA.

23. Olsson R, Bloom E, **Crowder DW** (2015) Research on wild pollinators. University of Idaho Pollination Seminar Series, Moscow, ID.
22. Chisholm P, **Crowder DW** (2015) Implications of non-vector herbivores for management of plant viruses in agricultural systems. Pacific Branch of the Entomological Society of America Annual Meeting, Couer d'Alene, WA.
21. D'Auria EM, Krey K, Orpet R (2014) The calls for the end of invasion biology are justified; this field should be replaced by the ecology of species redistribution. Student Debates, Entomology Society of America Annual Meeting, Portland, OR.
20. D'Auria EM, Wohleb C, **Crowder DW** (2014) Potato pest phenology models. WSU Potato Field Day, Othello, WA.
19. D'Auria EM, **Crowder DW** (2014) Dynamics of potato pests in Washington and Oregon. Hermiston Farm Fair, Hermiston, OR.
18. Chisholm P, Eigenbrode SD, **Crowder DW** (2014) Can non-vector herbivores suppress the spread of a plant virus? Annual Meeting of the Entomological Society of America, Portland, OR.
17. Lichtenberg E, Kennedy C, **Crowder DW** (2014) Effects of agricultural management and landscapes on the abundance and diversity of arthropods: a global analysis. Entomological Society of America Annual Meeting, Portland, OR.
16. Milosavljević I, Esser AD, Pike KS, **Crowder DW** (2014) Ecology and management of wireworms (Coleoptera: Elateridae) in cereal crops. Annual Meeting of the Entomological Society of America, Portland, OR.
15. Bloom E, Redmond B, **Crowder DW** (2014) Bee community ecology and urban fruit production. City Fruit Grower Meeting, Seattle, WA.
14. Bloom E, Redmond B, **Crowder DW** (2014) Bee community ecology: Introduction and field study. Seattle Tilth Grower Meeting, Seattle, WA.
13. Bloom E, **Crowder DW** (2014) The diversity, abundance, and stability of bees and pollination services. Snow Valley Tilth Grower Meeting, Carnation, WA.
12. Bloom E, **Crowder DW** (2014) Bee community ecology, the importance of pollinator health to pollination services. Sustainable South Sound Grower Meeting, Olympia, WA.
11. Bloom E, **Crowder DW** (2014) Science, insects, bees and technology. AT&T, Seattle, WA.
10. Bloom E, **Crowder DW** (2014) Science, insects, bees and society. University of Washington, Seattle, WA.
9. Bloom E, **Crowder DW** (2014) Science, insects, bees and society. Seattle University, Seattle, WA.
8. Bloom E, **Crowder DW** (2014) Bee community ecology and the diversity stability hypothesis. P-Patch Grower Meeting, Seattle, WA.
7. Bloom E, **Crowder DW** (2014) An inquiry into landscapes, community ecology, ecosystem services, research and conservation. P-Patch Grower Meeting, Seattle, WA.
6. D'Auria EM, Wohleb C, **Crowder DW** (2014) Potato pest phenology models. WSU Potato Field Day, Othello, WA.
5. Milosavljević I, Esser AD, **Crowder DW** (2014) Wireworms in your wheat. Washington State University Crop Diagnostic Clinic, Pullman, WA.
4. Milosavljević I, Esser AD, **Crowder DW** (2014) Wireworm research update. Wilke Farm Field Day, Davenport, WA.

3. Milosavljevic I, Esser AD, Pike KS, **Crowder DW** (2013) Wireworms as wheat pests in the PNW. Valent BioSciences Tour, Washington State University Wilke Research and Extension Farm, Davenport, WA.
2. Milosavljevic I, Esser AD, Pike KS, **Crowder DW** (2013) Wireworm management and distribution. The Northern Lincoln County Field Tour, Wilbur/Creston, WA.
1. Milosavljevic I, Pike K, Esser A, **Crowder DW** (2013) Distribution, biology, and ecology of wireworms in Washington cereal crops. Annual Meeting of the Pacific Branch of the Entomological Society of America Annual Meeting, Lake Tahoe, NV.

## Contributed Presentations

50. **Crowder DW** (2025) Influence of codling moth ecology on population dynamics and forecasting in apple crop systems. Washington Tree Fruit Commission Apple Crop Protection Meeting, Wenatchee, WA.
49. Stephenson T, Bartel S, Osburn ED, Strickland M, Jones M, Hudiburg TW, **Crowder DW**, Storfer A, Lynch L (2024) Playing devil's advocate: evaluating how an apex scavenger influences carcass-derived nutrient cycling in Tasmanian forests. American Geophysical Union Annual Meeting, Washington, DC.
48. **Crowder DW** (2024) Influence of codling moth ecology on population dynamics and forecasting in apple crop systems. Washington Tree Fruit Commission Apple Crop Protection Meeting, Wenatchee, WA.
47. **Crowder DW** (2023) Influence of codling moth ecology on population dynamics and forecasting in apple crop systems. Washington Tree Fruit Commission Apple Crop Protection Meeting, Wenatchee, WA.
46. **Crowder DW**, Borghi S, Oeller L (2023) Linking pest phenology and population dynamics with the WSU Decision Aid System. Orchard Pest Management and Disease Conference, Portland, OR.
45. Athey KJ, **Crowder DW**, Northfield T, Beers EH (2020) It's raining moths: drone technology for sterile codling moth release. Annual Meeting of the Entomological Society of America, Virtual Meeting.
44. Eigenbrode S, Clark RE, **Crowder DW**, Wu D (2019) Vector host breadth manipulation by plant viruses. Annual Meeting of the Entomological Society of America, St. Louis, MO.
43. Northfield T, Beers E, Brunner J, **Crowder DW**, Jones V (2019) Adapting SIR from eradication to IPM: issues to consider. Annual Meeting of the Pacific Branch of the Entomological Society of America, San Diego, CA.
42. Nikoukar A, **Crowder DW**, Esser A, Lewis E, Rashed A (2019) The effect of in-furrow application of pyrethroid in rotational crop in reducing wireworm damage in subsequent wheat. Annual Meeting of the Pacific Branch of the Entomological Society of America, San Diego, CA.
41. Lichtenberg E, **Crowder DW**, Milosavljevic I, Jha S, Heiser J (2018) Pollinator responses to habitat loss and sustainability-oriented land management practices. Annual Meeting of the Entomological Society of America, Vancouver, Canada.
40. Jones M, Headrick D, **Crowder DW**, Snyder W (2018) Organic farms conserve dung beetles capable of disrupting fly vectors of foodborne pathogens. Annual Meeting of the Entomological Society of America, Vancouver, Canada.

39. Beers B, **Crowder DW** (2018) Supplementing mating disruption with release of sterile codling moths in Washington apples. Annual Meeting of the Entomological Society of America, Vancouver, Canada.
38. **Crowder DW** (2016) Promoting pollinators and pollination services on diversified organic farms. USDA Organic Transitions PD Workshop, Washington, DC.
37. Esser AD, Pike KS, Sheffels M, Coffman M, Milosavljevic I, **Crowder DW** (2013) Controlling wireworms with thiamethoxam insecticides in wheat. National Association of County Agricultural Agents National Meeting, Pittsburgh, PA.
36. **Crowder DW** (2012) Can reduced-input farming restore biocontrol communities degraded by climate change. USDA PD Workshop, Washington, DC.
35. **Crowder DW**, Gable J, Northfield TD, Steffan SA, Snyder WE (2012) Niche engineering reveals complementary resource use. Annual Meeting of the Ecological Society of America, Portland, OR.
34. Martin E, **Crowder DW**, Owen J (2012) Agricultural intensification promotes West Nile virus infection. Washington State University Undergraduate Research Expo, Pullman, WA.
33. Northfield TD, **Crowder DW**, Takizawa T, Snyder WE (2011) Realistic variation in predator species richness produces emergent biodiversity effects. Annual Meeting of the Entomological Society of America, Reno, NV.
32. Jabbour R, **Crowder DW**, Aultman E, Snyder W (2011) Entomopathogen biodiversity increases host mortality. Annual Meeting of the Entomological Society of America, Reno, NV.
31. Gable J, **Crowder DW**, Northfield T, Snyder W (2011) Bottom-up mediation of predator diversity effects. Washington State University Undergraduate Research Expo, Pullman, Washington, USA.
30. Jabbour R, **Crowder DW**, Aultman E, Snyder W (2010) Pathogen biodiversity heightens host mortality. Annual Meeting of the Ecological Society of America, Pittsburgh, PA.
29. Aultman E, Jabbour R, **Crowder DW**, Snyder W (2010) Pathogen diversity increases host mortality. Annual Meeting of the Pacific Branch of the Entomological Society of America, Boise, ID, USA.
28. Aultman E, Jabbour R, **Crowder DW**, Snyder W (2010) Pathogen diversity increases host mortality. Washington State University Undergraduate Research Expo, Pullman, Washington, USA.
27. **Crowder DW**, Northfield TD, Strand MR, Snyder WE (2010) Restoring predator-pathogen evenness increases consumption of host/prey resources. Annual Meeting of the Ecological Society of America, Pittsburgh, PA.
26. **Crowder DW,** Northfield TD, Strand MR, Snyder WE (2010) Organic agriculture promotes evenness and natural pest control. Annual Meeting of the Entomological Society of America, San Diego, CA.
25. **Crowder DW,** Carrière Y (2010) A general theory for managing the evolution of arthropod resistance to genetically modified crops. USDA-NRI PD Workshop, Washington, DC, USA.
24. **Crowder DW,** Northfield TD, Strand MR, Snyder WE (2010) Organic agriculture restores evenness and natural pest control. USDA-NRI PD Workshop, Washington, DC, USA.
23. **Crowder DW,** Sitvarin M, Carrière Y (2008) Plasticity of female mating behavior drives competitive exclusion of whitefly biotypes. Annual Meeting of the Entomological Society of America, Reno, NV, USA.

22. **Crowder DW,** Ellers-Kirk C, Laor E, Karunker I, Dennehy T, Horowitz R, Morin S, Tabashnik B, Carrière Y (2008) Genetics and management of whitefly resistance to pyriproxyfen. University of Arizona BIO5 Institute Poster Session, Tucson, AZ, USA.
21. Heuberger SM, **Crowder DW,** Carrière Y (2008) Modeling the effect of gene flow on the evolution of resistance to transgenic crops in developing countries. Annual Meeting of the Entomological Society of America, Reno, NV, USA.
20. Carrière Y, **Crowder DW**, Ellers-Kirk C, Hartfield K, Orr BJ, Marsh SE, Ellsworth PC, Palumbo JC, Tabashnik BE, Dennehy TJ (2008) Development and field test of the refuge strategy for the management of whitefly resistance to pyriproxyfen. USDA-NRI PD Workshop, Reno, NV, USA.
19. Eldridge A, Carrière Y, **Crowder DW** (2008) Competition between the B and Q biotypes of *B. tabaci*. KEYS Internship Poster Session, Tucson, AZ, USA.
18. **Crowder D,** Dennehy T, Ellers-Kirk C, Ellsworth P, Tabashnik B, Carrière Y (2007) Field evaluation of resistance to pyriproxyfen in the sweetpotato whitefly (*Bemisia tabaci*). Annual Meeting of the Entomological Society of America, San Diego, CA, USA.
17. **Crowder D,** Ellers-Kirk C, Laor E, Karunker I, Dennehy T, Horowitz R, Morin S, Tabashnik B, Carrière Y (2007) Genetics and management of whitefly resistance to pyriproxyfen. Annual Meeting of the Entomological Society of America, San Diego, CA, USA.
16. **Crowder DW,** Ellers-Kirk C, Laor E, Karunker I, Dennehy T, Horowitz R, Morin S, Tabashnik B, Carrière Y (2007) Genetics and management of whitefly resistance to pyriproxyfen. USDA-NRI PD Workshop, San Diego, CA, USA.
15. **Crowder DW** (2007) Managing the sweetpotato whitefly in Arizona. Achievement Rewards for College Scientists Annual Banquet, Phoenix, AZ, USA.
14. **Crowder DW**, Carrière Y, Tabashnik BE, Dennehy TJ, Ellsworth PE (2006) Effects of operational factors on the evolution of resistance to an insect growth regulator by the sweetpotato whitefly. Annual Meeting of the Entomological Society of America, Indianapolis, IN, USA.
13. **Crowder DW,** Dennehy TJ, Carriere Y, Tabashnik BE (2006) Enhancing the sustainability of environmentally friendly whitefly control. Environmental Protection Agency Science Forum, Washington D.C., USA.
12. **Crowder DW,** Dennehy T, Ellsworth P, Carriere Y, Tabashnik B (2006) Sustainability of whitefly control using an insect growth regulator. Environmental Protection Agency Graduate Fellowship Conference, Washington D.C., USA.
11. **Crowder DW** (2006) Enhancing the effectiveness of environmentally friendly whitefly Control. Achievement Rewards for College Scientists Annual Banquet, Phoenix, AZ, USA.
10. **Crowder DW,** Carrière Y, Tabashnik BE, Dennehy TJ (2006) Genetic factors affecting the evolution of resistance to pyriproxyfen by the sweetpotato whitefly. Annual Meeting of the Pacific Branch of the Entomological Society of America Annual Meeting, Maui, HI, USA.
9. **Crowder DW** (2005) Enhancing the sustainability of environmentally-friendly whitefly control. Annual Meeting of the Entomological Society of America, Ft. Lauderdale, FL, USA.
8. **Crowder DW** (2005) Understanding and managing the sweetpotato whitefly, *Bemisia tabaci*. Achievement Rewards for College Scientists Annual Banquet, Phoenix, AZ, USA.
7. **Crowder DW,** Onstad DW (2004) Dynamic management strategies using transgenic corn for control of western corn rootworm. Annual Meeting of the Entomological Society of America, Salt Lake City, UT, USA.

6. **Crowder DW** (2004) Modeling the co-evolution of resistance to crop rotation and transgenic corn by western corn rootworm. NRES Student Symposium, University of Illinois, Urbana, IL, USA.
5. Onstad DW, **Crowder DW**, Huang Z (2003) Model of *Nosema* disease in bee hives. Annual Meeting of the Entomological Society of America, Cincinnati, OH, USA.
4. Goertz D, Onstad D, **Crowder DW**, Linde A (2003) Modeling the transmission of an insect pathogen (microsporidia) on its host, *Lymantria dispar* - a forest insect pest. Annual Meeting of the Society for Invertebrate Pathology, Burlington, VT.
3. Goertz D, Onstad D, **Crowder DW**, Linde A (2003) Modellierung des einflusses von insektenpathogenen (mikrosporidien) auf die populationsdynamik eines forstschädlings, *Lymantria dispar.* Conference of Entomology, German Society for General and Applied Entomology, Halle, Germany.
2. **Crowder DW,** Onstad DW (2003) Economics versus alleles: balancing IPM and IRM for rotation-resistant western corn rootworm. Annual Meeting of the Entomological Society of America, Cincinnati, OH, USA.
1. **Crowder DW,** Onstad DW (2002) Modeling the spread of the rotation-resistant western corn rootworm. Annual meeting of the Entomological Society of America, Ft. Lauderdale, FL, USA.

## Contributed Presentations by Members of Crowder Laboratory

85. Clough A, Wagstaff C, **Crowder DW** (2025) Molecular gut content analysis of *Circulifer tenellus* collected from Columbia Basin hemp, carrot, and hops fields to determine host plane use. Washington State University Showcase for Undergraduate Research and Creative Arts, Pullman, WA.
84. Wagstaff C, **Crowder DW** (2024) Assessing seasonal host use and pathogen transmission by beet leafhopper (*Circulifer tenellus*) in the Columbia Basin. Entomological Society of America Annual Meeting, Phoenix, AZ.
83. Wagstaff C, **Crowder DW** (2024) Assessing seasonal host use and pathogen transmission by beet leafhopper (*Circulifer tenellus*) in vegetable and hemp crop systems. Entomological Society of America Annual Meeting, Phoenix, AZ.
82. Baerlocher C, **Crowder DW** (2024) Responses of fall-sown *Pisum sativum* to herbivory by *Acyrthosiphon pisum* and infection by *Pea Enation Mosaic Virus* change depending on cultivar and *Rhizobium leguminosarum* pairing. Pacific Branch of the Entomological Society of America Annual Meeting, Honolulu, HI.
81. Oeller L, **Crowder DW** (2024) The past, present, and future of agricultural decision support tools. Pacific Branch of the Entomological Society of America Annual Meeting, Honolulu, HI.
80. Bartel SL, Lynch L, Stephenson T, Jones ME, Kittipalawattanapol K, Storfer A, **Crowder DW** (2023) Decline of an apex scavenger modifies scavenging communities and reduces the rate of carrion consumption. Ecological Society of America Annual Meeting, Portland, OR.
79. Clark RE, Rincon DF, Eigenbrode SD, Adikari S, **Crowder DW** (2023) Modeling pea aphid phenology and movement into pulse crops using segmented regression: implications for management. Entomological Society of America Annual Meeting, National Harbor, MD.
78. Foutz J, **Crowder DW**, Cooper R (2023) Weeding them out: molecular and landscape approaches to understanding beet leafhopper populations and potato purple top disease in

the Columbia River Basin. Pacific Branch of the Entomological Society of America Annual Meeting, Seattle, WA.

77. Jocson D, Orpet R, Nottingham L, Northfield T, Beers E, **Crowder DW** (2023) Using vibrational playbacks to disrupt mating behavior in *Cacopsylla pyricola*. Entomological Society of America Annual Meeting, National Harbor, MD.
76. Rampone E, **Crowder DW** (2023) Helping plants help themselves: the potential of soil amendments to mitigate insect pest pressure. Pacific Branch of the Entomological Society of America Annual Meeting, Seattle, WA.
75. Rincon DF, Ellard I, Clark RE, **Crowder DW** (2023) Impact of climate change on pea aphid development: is temperature increase the only driver? Entomological Society of America Annual Meeting, National Harbor, MD.
74. Blance M, Clark R, **Crowder DW** (2022) Using alternative hosts and machine learning to predict pest presence. Annual Meeting of the Pacific Branch of the Entomological Society of America, Santa Rosa, CA.
73. Jocson D, Beers E, Cooper W, **Crowder DW** (2022) Acoustic playbacks on plants can decrease reproductive success in pear psylla. Annual Meeting of the Pacific Branch of the Entomological Society of America, Santa Rosa, CA.
72. Foutz J, Cooper W, **Crowder DW** (2022) Weeding them out: molecular and landscape approaches to understanding beet leafhopper populations and potato purple top disease in the Columbia River Basin. Annual Meeting of the Pacific Branch of the Entomological Society of America, Santa Rosa, CA.
71. Luppino M, **Crowder DW** (2021) Pollinator pest prevalence depends on landscape context. Annual Meeting of the Entomological Society of America, Denver, CO.
70. Jocson D, **Crowder DW**, Beers EH (2021) Acoustic playbacks on plants can decrease reproductive success in pear psylla. Annual Meeting of the Entomological Society of America, Denver, CO.
69. Clark RE, Eigenbrode SD, **Crowder DW** (2021) Reverse-engineering phenology models with an ecoinformatics approach: insights from pea aphid vector biology. Annual Meeting of the Entomological Society of America, Denver, CO.
68. Jocson D, Horton DR, Beers E, **Crowder DW** (2021) Use of vibrational playbacks as mating disruption in *Cacopsylla pyricola*. Annual Meeting of the Pacific Branch of the Entomological Society of America, Virtual Meeting.
68. Basu S, Clark R, Blundell R, Casteel CL, **Crowder DW** (2020) Reciprocal antagonism between a plant virus and rhizobial bacteria in a legume crop. Annual Meeting of the Entomological Society of America, Virtual Meeting.
67. Cohen A, **Crowder DW** (2020) Effects of water stress on the transmission of an insect-vectored plant pathogen. Annual Meeting of the Pacific Branch of the Entomological Society of America, Spokane, WA.
66. Lee B, Clark R, Basu S, **Crowder DW** (2020) Predation risk influences insect-vectored plant virus transmission differentially through contrasting density-mediated effects. Annual Meeting of the Pacific Branch of the Entomological Society of America, Spokane, WA.
65. Malhotra P, Basu S, Lee B, **Crowder DW** (2020) Effects of soil rhizobia in a legume plant in response to a vector-borne plant pathogen under drought stress. Annual Meeting of the Pacific Branch of the Entomological Society of America, Spokane, WA.

64. Cohen A, **Crowder DW** (2019) Effects of water stress on transmission of '*Candidatus Liberibacter solancearum*' pathogen by the vector *Bactericera cockerelli*. Annual Meeting of the Entomological Society of America, St. Louis, MO.
63. Oeller E, **Crowder DW** (2019) Effects of fertilizer on pest population growth in quinoa. Annual Meeting of the Entomological Society of America, St. Louis, MO.
62. Jocson D, Horton DR, Beers E, **Crowder DW** (2019) *Capopsylla pyricola* uses substrate-borne vibrations to communicate with and attract mates (Hemiptera: Psyllidae). Annual Meeting of the Entomological Society of America, St. Louis, MO.
61. Lee B, Basu S, **Crowder DW** (2019) Predation risk and conspecific alarm cues affect pea aphid vector competence for *Pea Enation Mosaic Virus* during complex multitrophic interactions. Annual Meeting of the Entomological Society of America, St. Louis, MO.
60. Illan J, Bloom E, Wohleb C, Rondon S, Jensen A, Snyder W, **Crowder DW** (2019) Modelling biotic interactions of phytophagous insect pests across an agriculturally-dominated landscape. Annual Meeting of the Pacific Branch of the Entomological Society of America, San Diego, CA.
59. Olsson R, **Crowder DW** (2019) When it rains, it pours! (nectar, that is) (2019) Annual Meeting of the Pacific Branch of the Entomological Society of America, San Diego, CA.
58. Mattingly W, Olsson R, **Crowder DW** (2019) Pollinator communities of Pacific Northwest canola farms. Annual Meeting of the Pacific Branch of the Entomological Society of America, San Diego, CA.
57. Clark R, **Crowder DW** (2018) Tri-trophic interactions and vector biology in legume agroecosystems. Ecological Society of America National Meeting. New Orleans, LA.
56. Schaeffer RN, Fukami T, **Crowder DW**, Vannette R (2018) Niche-based priority effects dictate microbial impacts on a plant pathogen. Ecological Society of America National Meeting. New Orleans, LA.
55. Freeman M, Looney C, **Crowder DW** (2018) Collaborative investigation of *L. lilii* in Washington State. Annual Meeting of the Entomological Society of America, Vancouver, Canada.
54. Freeman M, Looney C, **Crowder DW** (2018) Novel Pacific Northwest host plants of *Lilioceris lilii* (Coleoptera: Chrysomelidae). Annual Meeting of the Entomological Society of America, Vancouver, Canada.
53. Lee B, **Crowder DW** (2018) Evaluating the non-consumptive effects of predators on aphid-borne viruses. Annual Meeting of the Entomological Society of America, Vancouver, Canada.
52. Orpet RJ, Unruh TR, **Crowder DW**, Jones VP (2018) Unraveling an omnivore's diet: European earwig (*Forficula auricularia*), a beneficial predator in apple orchards. Annual Meeting of the Entomological Society of America, Vancouver, Canada.
51. Orpet RJ, Jones V, **Crowder DW** (2018) Earwigs control aphids and do not damage apples: experimental evidence in four orchards. Orchard Pest and Disease Management Conference, Portland, OR.
50. Oeller E, **Crowder DW** (2018) Impacts of agronomic practices on *Lygus* (Hemiptera: Miridae) in quinoa. Annual Meeting of the Entomological Society of America, Vancouver, Canada.
49. Olsson R, **Crowder DW** (2018) The canola-pollinator relationships of eastern Washington and northern Idaho. Annual Meeting of the Entomological Society of America, Vancouver, Canada.

48. Cohen A, **Crowder DW** (2018) The effect of water stress on transmission and dispersal of an insect-vectored plant pathogen. Annual Meeting of the Entomological Society of America, Vancouver, Canada.
47. Cohen A, **Crowder DW** (2017) Settlement and departure preferences of *Bactericera cockerelli* (Hemiptera: Triozidae). Annual Meeting of the Entomological Society of America, Denver, CO.
46. Olsson R, Schaeffer R, **Crowder D** (2017). Environmental stresses and their effect on pollen and nectar quality. Annual Meeting of the Entomological Society of America, Denver, CO.
45. Bloom E, Reganold J, **Crowder DW** (2017). The value of ecosystem services on organic and conventional farms. Annual Meeting of the Entomological Society of America, Denver, CO.
44. Orpet RJ, **Crowder DW**, Jones VP (2017) European earwig (*Forficula auricularia*), an underappreciated aphid predator in apple orchards, not a pest. Annual Meeting of the Entomological Society of America, Denver, CO.
43. Orpet RJ, Goldberger J, **Crowder D**, Jones V (2017) Earwigs help apple growers manage aphids and are underappreciated. Washington State University Graduate and Professional Student Association Research Expo, Pullman, WA
42. Bloom E, Olsson R, Redmond B, **Crowder DW** (2017) Providing habitat for wild bees on organic farms. eXtension/eOrganic Webinar Series, Oregon State University, Corvallis, OR.
41. Orpet RJ, Crowder DW, Jones VP (2017). Woolly apple aphids research update. Washington State Tree Free Association Annual Meeting, Wenatchee, WA.
40. Cohen A, **Crowder DW** (2017) Modeling seasonal population dynamics of the potato psyllid, *Bactericera cockerelli* (Hemiptera: Triozidae). Pacific Branch of the Entomology Society of America Annual Meeting, Portland, WA.
39. Olsson R, **Crowder DW** (2017) Is city life affecting your diet? A study of bumble bee lipid content across urbanized landscapes. Pacific Branch of the Entomology Society of America Annual Meeting, Portland, WA.
38. Orpet, RJ, Jones V, **Crowder DW** (2017) Underappreciated: European earwig (*Forficula auricularia*) is a beneficial predator in apple orchards. Pacific Branch of the Entomology Society of America Annual Meeting, Portland, WA.
37. Orpet, RJ, Goldberger J, Jones V, **Crowder DW** (2017) Earwigs help apple growers manage aphids and are underappreciated. Washington State University Graduate and Professional Student Association Research Expo, Pullman, WA.
36. Orpet RJ, Beers EE, Reganold JP, Goldberger J, Jones VP, **Crowder DW** (2016) How orchard soil, nutrition, natural enemies, management, and grower perceptions relate to woolly apple aphid problems. International Congress of Entomology, Orlando, FL.
35. Chisholm P, **Crowder DW** (2016) Competition with non-vectors mediates virus-vector interactions. International Congress of Entomology, Orlando, FL.
34. Olsson R, **Crowder DW** (2016) Landscape use and bee health. International Congress of Entomology, Orlando, FL.
33. Bloom E, **Crowder D** (2015) Diverse nest substrate may be essential for bee conservation on farms. Annual Meeting of the Entomological Society of America, Minneapolis, MN.
32. Olsson R, Bloom E, **Crowder D** (2015) What's your favorite food? Floral preference of honey bees and bumblebees in Western Washington. Annual Meeting of the Entomological Society of America, Minneapolis, MN.

31. Chisholm P, **Crowder D** (2015) Exchange of virus and vector populations between natural and managed habitats. Annual Meeting of the Entomological Society of America, Minneapolis, MN.
30. Chisholm P, **Crowder D** (2015) Implications of non-vector herbivores for plant virus management in agricultural systems. Washington State University Wiley Research Expo, Pullman, WA.
29. Bloom E, **Crowder DW** (2015) Promoting native bee pollinators in organic farming systems. EOrganic Webinar, Corvallis, OR.
28. Bloom E, Olsson R, **Crowder D** (2015) Bee identification and monitoring. Citizen Science Outreach Course, Ravenna Eckstein Community Center, Seattle, WA.
27. Bloom E, Olsson R, **Crowder D** (2015) Bee identification and monitoring. Citizen Science Outreach, Ballard Community Center, Seattle, WA.
26. Bloom E, Olsson R, **Crowder DW** (2015) Bee identification and monitoring. Citizen Science Outreach, Bradner Gardens, Seattle, WA.
25. Bloom E, Olsson R, **Crowder DW** (2015) Bee identification and monitoring. Citizen Science Outreach, 21 Acres, Woodinville, WA.
24. Bloom E, Olsson R, **Crowder DW** (2015) Bee identification and monitoring. Citizen Science Outreach, Magnuson Community Center, Seattle, WA.
23. Bloom E, Olsson R, **Crowder DW** (2015) Bee identification and monitoring. Citizen Science Outreach, Ravenna Eckstein Community Center, Seattle, WA.
22. Bloom E, Olsson R, **Crowder DW** (2015) Bee identification and monitoring. Citizen Science Outreach, Magnuson Community Center, Seattle, WA.
21. Bloom E, Olsson R, **Crowder DW** (2015) Bee identification and monitoring. Citizen Science Outreach, Bradner Gardens, Seattle, WA.
20. Bloom E, Olsson R, Redmond B, **Crowder DW** (2015) Global status of pollinators, bee identification and monitoring. Field Day at Wobbly Cart Farm, Rochester, WA.
19. Bloom E, Olsson R, Redmond B, **Crowder DW** (2015) Global status of pollinators, bee identification and monitoring. Field Day at Camp Korey Farm, Carnation, WA.
18. Bloom E, Olsson R, Redmond B, **Crowder DW** (2015) Global status of pollinators, bee identification and monitoring. Field Day at Viva Farms, Mount Vernon, WA.
17. Orpet R, Beers E, Reganold J, Goldberger J, Jones V, **Crowder D** (2015) Dynamics of woolly apple aphid *(Eriosoma lanigerum*) under organic and conventional orchard management. Pacific Branch of the Entomological Society of America Annual Meeting, Couer d'Alene, ID.
16. Bloom E, **Crowder D** (2014) The diversity of bees in urban and rural diversified farming systems. BioAg Symposium, Pullman, WA.
15. Chisholm P, **Crowder D** (2014) Implications of non-vector herbivores for management of plant viruses in agricultural systems. Annual Meeting of the Entomological Society of America, Portland, OR.
14. Bloom E, **Crowder DW** (2014) The community ecology of bees in urban and rural diversified farming systems. Annual Meeting of the Entomological Society of America, Portland, OR.
13. D'Auria EM, **Crowder DW** (2014) Increased susceptibility of Colorado potato beetle (*Leptinotarsa decemlineata* Say) to pathogens following exposure to predators. Annual Meeting of the Entomology Society of America, Portland, OR.

12. Bloom E, **Crowder DW** (2014) The diversity of bees in urban and rural diversified farming systems. BioAg Research Symposium, Pullman, WA.
11. Behrend P, **Crowder D** (2014) A meta-analysis of factors contributing to the dilution effect in vector-borne disease. Student Undergraduate Research and Creative Activities Symposium, Pullman, WA.
10. Badger J, Chisholm P, **Crowder DW** (2014) Effects of herbivory and virus infection on pea aphid fitness and movement. Student Undergraduate Research and Creative Activities Symposium, Pullman, WA.
9. Milosavljević I, Esser AD, Pike KS, **Crowder DW** (2014) Plant mediated interactions between below-ground and above-ground pests of cereal crops. Annual Wiley Research Exposition, Pullman, WA.
8. Murray TA, Milosavljević I (2014) Wireworm monitoring and management. Annual Eastern Klickitat Conservation District Meeting, Bickleton, WA.
7. Milosavljevic I, Esser AD, Pike KS, **Crowder DW** (2014) Below- and above-ground herbivore interactions in cereal crops. Annual Pacific Northwest Insect Management Conference, Portland, OR.
6. Milosavljevic I, Esser AD, Pike KS, **Crowder DW** (2014) The economic wireworms of the Pacific Northwest. Annual Pacific Northwest Insect Management Conference, Portland, OR.
5. Chisholm P, **Crowder DW** (2013) Effects of a plant virus on community dynamics in peas. Annual Meeting of the Entomological Society of America, Austin, TX.
4. Milosavljevic I, Esser A, Pike KS, **Crowder DW** (2013) Ecology of wireworms (Coleoptera: Elateridae) in cereal crops. Annual Meeting of the Entomological Society of America, Austin, TX.
3. Lichtenberg E, Kennedy C, **Crowder DW** (2013) Effects of farming practices on local and regional abundance, richness, and evenness of arthropods. Annual Meeting of the Entomological Society of America, Austin, TX.
2. Miller T, **Crowder DW** (2013) Colorado potato beetle vitality against pathogens after exposure to predators. Washington State University Undergraduate Research Expo, Pullman, Washington, USA.
1. Martin E, **Crowder DW**, Owen J (2012) Agricultural intensification promotes West Nile virus infection. Washington State University Undergraduate Research Expo, Pullman, Washington, USA.

## Professional Service

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| 2025-present | Member, National Academy of Sciences Committee on the Status of Insects in North America |
| 2025-present | Chair, Promotion and Tenure Committee (Priya Basu, WSU Entomology) |
| 2025-present | Chair, Promotion and Tenure Committee (Rob Curtiss, WSU Entomology) |
| 2025-present | Chair, WSU Service Center Directors Committee |
| 2025 | Chair, WSU Mid-Career Faculty Awards Selection Committee |
| 2025 | Organizer, WSU Department of Entomology Spring Colloquium |
| 2025 | Organizer, WSU Department of Entomology E Paul Catts Lecture |
| 2025 | Member, WSU CAHNRS Admin Professional Technical Staff Excellence Award Committee |
| 2025 | Member, WSU CAHNRS Classified Technical Staff Excellence Award |

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| | Committee |
| 2025 | Member, Western SARE Research and Education Grant Review Panel |
| 2024-present | Member, WSU Molecular Plant Sciences Executive Committee |
| 2024 | Chair, WSU Mid-Career Faculty Awards Selection Committee |
| 2024-present | Member, WSU Entomology Chair's Advisory Committee |
| 2024-present | Chair, WSU Entomology Awards Committee |
| 2024-present | Chair, Promotion Committee (Kiwamu Tanaka, WSU Plant Pathology) |
| 2024-present | Member, WSU CAHNRS Dean Search Committee |
| 2024 | Organizer, Section Symposium at the Entomological Society of America Annual Meeting Symposium (Title: IPM in the Digital Age: Using Big Data to Enhance Decision-Making and Bridge Adoption Gaps). |
| 2024 | Member, WSU CAHNRS Admin Professional Technical Staff Excellence Award Committee |
| 2024 | Member, WSU CAHNRS Admin Professional Staff Excellence Award Committee |
| 2024 | Organizer, Entomology Workshops at WSU Cougar Kid's Camp |
| 2023-present | Chair, WSU CAHNRS Hatch Project "*Enhancing Sustainability Across Diverse Agricultural Systems*" |
| 2023-present | Member, WSU Molecular Plant Sciences Fundraising Committee |
| 2023-present | Member, WSU Molecular Plant Sciences Recruitment Committee |
| 2023-2024 | Chair, WSU Entomology Pollinator Health Faculty Search Committee |
| 2023 | Member, WSU Mid-Career Faculty Awards Selection Committee |
| 2023 | Member, NSF Ecosystems Program Review Panel |
| 2022-2025 | Member, Advisory Board for USDA Specialty Crop Research Initiative Project "*Optimizing Blueberry Pollination To Ensure Future Yields"* |
| 2022-2025 | Member, Faculty Panel for WSU Tenure and Promotion Workshop |
| 2022-2024 | Member, WSU CAHNRS Foundation Growth and Visioning Task Force |
| 2021-2023 | Chair, Promotion and Tenure Committee (Jennifer Han) |
| 2021 | Member, USDA Pest and Beneficial Species Review Panel |
| 2021-present | Member, Promotion and Tenure Committee (Louis Nottingham) |
| 2021 | Organizer, WSU Department of Entomology Fall Colloquium |
| 2020-present | Member, WSU Entomology Curriculum Committee |
| 2020 | Member, NSF Values-based Academic Leadership Trajectories for Women in STEM Advisory Committee |
| 2020 | Member, WSU CAHNRS Faculty Awards Selection Committee |
| 2019-present | Organizer, Entomology Workshops at Pullman Preschool |
| 2019 | Member, WSU CAHNRS Associate Dean for Research Search Committee |
| 2019 | Member, Western SARE Research and Education Grant Review Panel |
| 2018-2023 | Editor, *Frontiers in Sustainable Food Systems* |
| 2018-2019 | Chair, WSU Entomology Curriculum Committee |
| 2018-2019 | Member, WSU Entomology Chair's Advisory Committee |
| 2018-2019 | Member, WSU Entomology Search Committee for Systematics Position |
| 2018 | Member, WSU CAHNRS Ag Weather Net Director Search Committee |
| 2017-2023 | Member, WSU CAHNRS Plant Growth Facilities Advisory Committee |
| 2017 | Member, WSU Entomology Search Committee for Tree Fruit IPM Position |
| 2016 | Member, USDA Organic Transitions Grant Review Panel |

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| 2015 | Organizer, Section Symposium at the Entomological Society of America Annual Meeting (Title: Effects of Global Climate Change on Species Interactions and Biological Control) |
| 2015 | Organizer, Program Symposium at the Pacific Branch of the Entomological Society of America Annual Meeting (Title: Arthropod Interactions with Plants and Pathogens) |
| 2014-present | Editor, *Food Webs* |
| 2014 | Organizer, Section Symposium at the Entomological Society of America Annual Meeting (Title: Entomology's Role in Sustaining Ecosystem Services in Agroecosystems) |
| 2014 | Organizer, Program Symposium at the Pacific Branch of the Entomological Society of America Annual Meeting (Title: Ecology and Management of Insects Across Agricultural Landscapes) |
| 2013-2023 | Member, WSU Small Grains Extension Team |
| 2013-2017 | Member, Entomology Department Teaching Committee |
| 2013-2017 | Advisor, Entomology Graduate Student Association (winner of the WSU President's Award for Leadership in 2014, 2015, and 2016) |
| 2013-2015 | Co-Chair, Program Development for the Pacific Branch of the Entomological Society of America Annual Meeting |
| 2013-2014 | Member, Entomology Department Seminar Committee |
| 2013 | Organizer, Program Symposium at the Entomological Society of America Annual Meeting (Title: Global Change, Biodiversity, and Biological Control) |
| 2013 | Organizer, Workshop on Population and Landscape Genetics of Insecticide Resistance (NimBIOS Sponsored Workshop, Knoxville, TN) |
| 2013 | Co-Editor, special issue of the journal Biological Control. Special issue focus: Global Change, biodiversity, and biological control. |
| 2013 | Organizer, WSU Department of Entomology Fall Colloquium |
| 2013 | Judge, WSU Auvil Fellowship |
| 2012-present | Chair, WSU Entomology Department Graduate Admissions Committee |
| 2012-2014 | Judge, Larry Larson Graduate Student Award for Leadership in Applied Entomology |
| 2012-2014 | Judge, Showcase for Undergraduate Research and Creative Activities, WSU |
| 2010-2011 | Member, Advisory Committee of the 1st International Whitefly Conference |
| 2007 | Student Representative, University of Arizona Department of Entomology |
| 2005 | Co-Organizer, University of Arizona Department of Entomology Seminar Series |

***Invited Editor:*** *Proceedings of the National Academy of Sciences USA (2 manuscripts in 2025)*

***Reviewer of Scientific Manuscripts***: *Agriculture, Ecosystems & Environment; American Naturalist; Annals of Applied Biology; Australian Journal of Entomology; Basic and Applied Ecology; BioControl; Biological Conservation; Biological Control; Biological Invasions; Biology Letters; Bulletin of Entomological Research; Canadian Journal of Plant Science; Center for the Synthesis and Analysis of Biodiversity; Crop Protection; Current Opinions in Insect Science; Ecological Entomology; Ecology; Ecology Letters; Entomologia Experimentalis et Applicata; Environmental Entomology; European Journal of Entomology; Food Webs; Functional Ecology; Insect Science; Integrative Zoology; International Journal of Pest*

*Management; Journal of Animal Ecology; Journal of Applied Ecology; Journal of Economic Entomology; Journal of Insect Physiology; Journal of Insect Science; Journal of Pest Science; Journal of the Association of Arab Universities for Basic and Applied Sciences; Molecular Ecology; National Science Foundation; Nature; Nature Communications; Oecologia; Oikos; Philosophical Transactions of the Royal Society of London; PLoS ONE; Proceedings of the National Academy of Sciences; Proceedings of the Royal Society of London Series B: Biological Sciences, Science, Scientific Reports*

***Reviewer of Promotion and Tenure Packets***: Colorado State University (2 packets), Cornell University, Michigan State University, Oregon State University, St. Lawrence University, University of California Riverside, University of Kentucky, University of Minnesota

***Reviewer of Grant Proposals***: National Science Foundation, United States Department of Agriculture AFRI, United States Department of Agriculture Hatch, United States Department of Agriculture Foundation for Food and Agricultural Research, European Union Research and Innovation Program, National Research Council of Canada, Western SARE

## Sabbatical Leaves

2019-2020 University of Missouri, Division of Plant Science and Technology. Faculty Host: Deborah Finke (Professor and Director of Undergraduate Studies).

## Professional Training

2018-2019 Washington State University Provost's Leadership Academy

## Memberships in Professional Societies

Entomological Society of America
International Organization of Biological Control
American Association for the Advancement of Science

## Popular Press

"The digital future of Ag". Washington Grown, Northwest Public Radio. https://www.wagrown.com/blog/farming/item/the-digital-future-of-ag

"Invasive stink bug habitat could expand with climate change". Washington State University News. https://news.wsu.edu/press-release/2022/09/26/invasive-stink-bug-habitat-could-expand-greatly-with-climate-change/ (#2 read story from WSU News in 2022, with estimated reach of 2.10 billion readers)

"Scientists predict potential spread, habitat of invasive Asian giant hornet". Washington State University News. https://news.wsu.edu/news/2020/09/23/scientists-predict-potential-spread-habitat-invasive-asian-giant-hornet/". (#1 read story from WSU News in 2020, with estimated reach of 3.52 billion readers)

"Organic farming isn't just green – it's very good business." *Washington Post* (2 June 2015). http://www.washingtonpost.com/news/energy-environment/wp/2015/06/02/organic-farming-isnt-just-environmentally-friendly-its-very-good-business-for-farmers/

"Why it might actually pay to be an organic farmer." *Time Magazine* (1 June 2015). http://time.com/3902279/organic-farming-environment/

"Can organic be profitable? If the price is right, WSU study says." *Seattle Times* (1 June 2015). http://www.seattletimes.com/seattle-news/can-organic-be-profitable-if-the-price-is-right-study-says/

"Farmers Find Organic Arsenal to Wage War on Pests." *New York Times* (29 Nov 2010). http://www.nytimes.com/2010/11/30/science/30farm.html

"Getting even with pests." *Nature Podcast* (1 July 2010). http://www.nature.com/nature/podcast/index-2010-07-01.html

"Organic farms win at potato pest control." *Nature News* (30 June 2010). DOI:10.1038/news.2010.324 News.

"WSU study on potato farming gives organic way a boost." *Seattle Times (*30 June 2010). http://www.seattletimes.com/seattle-news/wsu-study-on-potato-farming-gives-organic-way-a-boost/