DR. DANESHA SETH CARLEY

Director, NSF Center for Integrated Pest Management

Associate Professor, Department of Horticultural Science

North Carolina State University, Raleigh, NC 27695

Telephone: (919) 621-2012 Email: dgseth2@ncsu.edu

ORCID 0000-0001-7891-8530

EDUCATION

North Carolina State University, Raleigh, NC, Crop Science, Postdoctoral Fellow, 2006-2009

North Carolina State University, Raleigh, NC, Co-Major, Plant Pathology and Crop Science, Ph.D., 2006

The University of Tennessee, Knoxville, TN, Entomology and Plant Pathology, M.S., 2001

Earlham College, Richmond, IN, Biology, B.S., 1998

ACADEMIC POSITIONS AND EMPLOYMENT

Director, Center for Integrated Pest Management (CIPM), 2021-present

Interim Co-Director, Center for Integrated Pest Management (CIPM), 2018-2020

Director, Center of Excellence for Regulatory Science in Agriculture, NC State, 2017-present

Director, Southern IPM Center, CIPM, NC State, 2015-2020

IPM Coordinator, State of NC, NC State, 2013-present

Associate Professor, Department of Horticultural Science, NC State University, 2016-present

Assistant Professor, Department of Horticultural Science, NC State University, 2015-2016

Assistant Professor, Department of Crop Science, NC State University, 2010-2015

Coordinator for College Sustainability Programs, NC State University, 2010-2013

Research Assistant, NC State University, 2009-2010

Postdoctoral Scholar, NC State University 2006-2009

BOOKS

Pollinator Gardening for the South: Creating Sustainable Habitats by Danesha Seth Carley and Anne Spafford. UNC Press, Chapel Hill, NC. 152pp. March 2021.

Community Gardening for the South: Building Community from the Ground Up by Danesha Seth Carley. UNC Press, Chapel Hill, NC (proposal accepted April, 2021; in progress)

RECENT PEER-REVIEWED PUBLICATIONS

Mata, M., D. Seth Carley, E. Youngstead, J-J. Dubois, T. W. Rufty. 202X. Bee Nutrition in a Changing

Climate. PlosOne. Submitted.

Seth Carley, D., L. A. Gragg, M. J. Taggart, T. W. Rufty. 2021 Estimation of water stress tolerance of six

woody plant species. Horticulture International Journal. 5(2): 64-72.

Seth Carley, D. and K. Armbrust. 2021. Making the Case for Regulatory Science in Agriculture. ACS Agricultural Science & Technology. Manuscript ID: as-2021-00011y.

Billeisen, T.L., L.D. Kilpatrick, D. Seth Carley, R. L. Brandenburg. 2021. Presence of Pollinator-Friendly Habitat on Pollinator Communities in Managed Turfgrass Systems. International Turfgrass Society Research Journal. doi: https://doi.org/10.1002/its2.56.

Levine, S.L., J. Giddings, T. Valenti, G.P. Cobb, D. Seth Carley, L.L. McConnell. 2019. Overcoming Challenges of Incorporating Higher-Tier Data in Ecological Risk Assessments and Risk Management of Pesticides in the United States: Findings and Recommendations from the 2017 Workshop on Regulation and Innovation in Agriculture. Integrated Environmental Assessment and Management (IEAM). 15(5): 714–725. doi: 10.1002/ieam.4173.

Mata, M., D. Seth Carley, A. Hamblin, and J-J Dubois. 2019. Community Outreach as a Tool for Bee Conservation Efforts. Journal of Extension. 57:5 https://joe.org/joe/2019october/tt5.php

EXTENSION AND POPULAR PRESS PUBLICATIONS – 15

PUBLISHED ABSTRACTS AND POSTERS – 31

INVITED EXTERNAL/INTERNATIONAL PRESENTATIONS - 25

LOCAL PRESENTATIONS - 82

PODCASTS, YOUTUBE, PRESS RELEASES, AND NEWS INTERVIEWS – 22

GODSHEN ROBERT PALLIPPARAMBIL

Assistant Director, NSF Center for Integrated Pest Management (CIPM), NC State University (NCSU)

1730 Varsity Dr., STE 110, Raleigh, NC 27606; Ph: +1 919-855-7527 | Email: grpallip@ncsu.edu

EDUCATION

2010. Ph.D. Entomology. University of Arkansas, Fayetteville, AR.

2006. M.S. Entomology. Montana State University, Bozeman, MT.

2002. B.S. Agriculture. Kerala Agricultural University, India.

WORK EXPERIENCE SUMMARY

- Assistant Director. 2021-present. NSF Center for Integrated Pest Management, North Carolina State University, Raleigh, NC.
- Senior Research Scholar. 2018-2020. NSF Center for Integrated Pest Management, North Carolina State University, Raleigh, NC.
- Research Scholar. 2014-2018. NSF Center for Integrated Pest Management, North Carolina State University, Raleigh, NC.
- Postdoctoral Research Associate. 2011-2013. Plant-pest interactions in biofuel cropping systems. Energy Biosciences Institute, University of Illinois, Urbana Champaign, IL.
- Postdoctoral Research Associate. 2011. Development of a system dynamics model to investigate the impact of environmental factors and plant processes on the productivity of a biofuel crop. Department of Entomology, University of Arkansas, Fayetteville, AR.
- Senior Graduate Research Assistant. 2006-2010. Tissue specific expression of Mi-mediated resistance in tomato and its interactions with the potato aphid, Macrosiphum euphorbiae and the predator, Orius insidiosus. Ph.D. research, Department of Entomology, University of Arkansas, Fayetteville, AR.
- Graduate Research Assistant. 2004-2006. Biological control of wheat stem sawfly, Cephus cinctus. M.S. research, Department of Entomology, Montana State University, Bozeman, MT.
- Research Assistant. 2003. Biological control of insects and invasive weeds. All India Coordinated Research Project, Kerala Agriculture University, Kerala, India.

MENTORING & SUPERVISORY ROLE (at NC State)

CIPM researchers I mentored over the years are currently working in numerous organizations including government (USDA APHIS PPQ, EPA), biosciences industry (bioMASON Inc., GreenLight Biosciences) and IT industry (Amazon, Google, Goldman Sachs, ORACLE, Yelp, HBO, Red Hat, Dell etc.). Some continue to contribute to different projects in CIPM.

- At present, I am directly supervising 19 staff of which 9 are permanent EHRA/SHRA employees. This includes 6 supervisors.

- 2019-present. I am currently mentoring 4 co-P.I.s on multiple topics including grant preparation, agreement management, and team management.

CONTRACTS & GRANTS – NCSU LIST (9 years, N=46, total = $9,974,708) (Recent grants included below)

2022-2023	Co P.I., Grant awarded through Plant Protection Act Section 7721 Funding. Cooperative agreement titled “Protecting United States Fruit and Vegetable Industry from the Introduction of the Oriental Fruit Fly.”	$99,884
2022-2023	Lead P.I., Grant awarded through Plant Protection Act Section 7721 Funding. Cooperative agreement titled “Evaluating and Optimizing the Delimitation Survey Expert System (DSES) for New Pest Response Teams Based on field Use.”	$146,178
2022-2023	Lead P.I., Grant awarded through Plant Protection Act Section 7721 Funding. Cooperative agreement titled “Develop, Validate, and Deliver an Impact Assessment Rapid-screening Framework for Rapid Prioritization of Exotic Pests.”	$142,822
2022-2023	Lead P.I., Grant awarded through Plant Protection Act Section 7721 Funding. Cooperative agreement titled “Practical Applications of Models for Enhancing Sterile Insect Technique(SIT) and Other Pest Surveillance Programs.”	$111,308
2022-2023	Co P.I., Cooperative agreement with USDA titled “North Carolina 22 Exotic Plant Pest Monitoring (PestLens).”	$288,371
2022-2023	Lead P.I., Grant awarded through Plant Protection Act Section 7721 Funding. Cooperative agreement titled “Enhance Exotic Plant-Pest Mitigation and Response by Developing New Pest Response Guidelines.”	$364,370

RECENT TEACHING, TRAINING & SYMPOSIA ORGANIZATION

1. Seth Carley, D., Pallipparambil, G. R. 2023. 15th IUPAC International Congress of Crop Protection Chemistry. Presentations in Theme: Digital and Precision Agriculture for Sustainable Agriculture and its Stewardship, Delhi, India. (Co-organizer)

2. Pallipparambil, G. R. 2022 (Spring). STS 323. World Population and Food Prospects. Topic: Global Plant Biosecurity: Pursuing food security and a career in agricultural sciences. Undergraduate course, North Carolina State University. (Lecturer)

3. Pallipparambil, G. R. 2021 (Fall). STS 323. World Population and Food Prospects. Topic: Global Plant Biosecurity: Pursuing food security and a career in agricultural sciences. Undergraduate course, North Carolina State University. (Lecturer)

4. Pallipparambil, G. R., Suiter, K. 2019. Predicting, monitoring and responding to new plant pests: strategies and frameworks. XIX International Plant Protection Congress. Hyderabad, India. (Lead-organizer)

Yu Takeuchi, Ph.D. (ORCID 0000-0003-4734-9608)

NCSU Center for Integrated Pest Management

1730 Varsity Dr. Suite 110 Raleigh, NC 27606

Phone: 919-855-7541

Email: yu_takeuchi@ncsu.edu

Ph.D. 2016. NC State University, Forestry and Environmental Resources.

M.S. 2001. Mississippi State University, Forestry.

B.S. 1998. Mississippi State University, Forestry.

Professional Appointments:

North Carolina State University, Center for Integrated Pest Management

2022 - Present Associate Director for Innovation

2022 – Present Principal Research Scholar

2018 - 2022 Senior Research Scholar

2016 - 2018 Research Scholar

2002 - 2016 Research Assistant

North Carolina State University, Department of Forestry and Environmental Resources

2017 - Present Adjunct Assistant Professor

United Nations, Food and Agriculture Organization

2013 - 2015 Consultant

Recent Significant Research Experience:

Principal Research Scholar: Center for Integrated Pest Management, 2022 - Present

• Develop plant pest forecast and management systems to prevent exotic pest entries and to control plant pests effectively.

• Lead developer of a spatial analytic framework to support pest survey, agricultural trades, and commodity risk assessments.

• Developed new approaches to assess pest climate suitability maps to support pest survey activities.

• Assessed the global scale air passenger traveling patterns to assess the likelihood of new pest introductions into the United States by building Bayesian network models.

• Transformed new research topics into multiple cooperative agreements in support of mission area for U.S. Department of Agriculture, Animal and Plant Health Inspection Service (APHIS)

• Established research partnership with U.S. federal agencies (USDA - APHIS, Forest Service, Agricultural Research Service, Climate Hub), academic institutes (NCSU Center for Geospatial Analytics, State Climate Office of NC, University of Hawaii, University of Puerto Rico, and Lincoln University (New Zealand)), and other institutions such as Hawaii Department of Agriculture, Cenicafé (Colombia), and AgResearch (New Zealand).

Adjunct Assistant Professor: Dept. of Forestry and Environmental Resources, 2017 - Present

• Directed graduate program supervision and guidance of NCSU masters and PhD students.

• Served as a committee member for a Ph.D. students at the Center for Geospatial Analytics.

• Collaborated with faculty members on the development of research opportunities, active collaboration, and proposals.

Recent peer-reviewed articles:

1. Takeuchi, Y., Benavides, P., Johnson, M., Follett, P., Hossain, M.K., Navarro, L. & Giraldo-Jaramillo, M. 2022. Pathway Analysis: Likelihood of Coffee Berry Borer (Hypothenemus hampei Ferrari) Introduction into the Hawaiian Islands by Air Passenger Travel. 54: 1-20.

2. Kim, M.S., Hantula, J., Kaitera, J., Zambino, P.J., Woodward, S., Richardson, B.A., Stewart, J.E., Spaine, P., Shaw, D.C., Takeuchi, Y. & Klopfenstein, N.B. 2022. Recovery Plan for Scots Pine Blister Rust Caused by Cronartium pini. Plant Health Progress 23: 105-130. doi:10.1094/php-06-21-0099-rp.

3. Takeuchi, Y., Koch, F. H., Nelson, S. A. C. 2021. Recent Immigrant Insect Fauna – Another Look at a Classic Analysis. Journal of Integrated Pest Management, 12(1): 37. https://doi.org/10.1093/jipm/pmab034

4. Xia, Y., Ouyang, G. C., and Takeuchi, Y. 2021. A Brief Review of Resseliella citrifrugis (Diptera: Cecidomyiidae), a Lesser-Known Destructive Citrus Fruit Pest. Journal of Integrated Pest Management, 12(1): 36. https://doi.org/10.1093/jipm/pmab033

5. Jones, C. M., S. Jones, A. Petrasova, V. Petras, D. Gaydos, M. M. Skrip, Y. Takeuchi, K. Bigsby, and R. K. Meentemeyer. 2021. Iteratively forecasting biological invasions with PoPS and a little help from our friends. Frontiers in Ecology and the Environment 19: 411-418.

6. Krishnankutty, S. M., K. Bigsby, J. Hastings, Y. Takeuchi, Y. Wu, S. W. Lingafelter, H. Nadel, S. W. Myers, and A. M. Ray. 2020. Predicting Establishment Potential of an Invasive Wood-Boring Beetle, Trichoferus campestris (Coleoptera: Cerambycidae) in the United States. Annals of the Entomological Society of America 113: 88-99.

JENNIFER COLLEEN COOK (SHAFFER)
Raleigh, NC 27610 – 386- 266-8108
biocontrol.jennifer.cook@gmail.com

EDUCATION

- **Doctor of Philosophy in Plant Pathology**, University of Florida, Gainesville, FL, August 2006

  DISSERTATION: Integrated Control of Dodder (*Cuscuta pentagona* Engelm.) Using Glyphosate, Ammonium Sulfate, and the Biological Control Agent *Alternaria destruens* Simmons, sp. *nov.*
- **Master of Science in Horticulture**, North Carolina State University, Raleigh, NC, May 2002

  THESIS: The Evaluation of Two Bacterial Plant Pathogens, *Xanthomonas campestris* pv. *poannua* and *Pseudomonas syringae* pv. *tagetis*, as Biological Control Agents for Weed Management
- **Bachelor of Science in Biology**, Pennsylvania State University (Behrend College), Erie, PA, May 1991
- **Associate of Science in Applied Health Science**, Community College of the Air Force, Montgomery, AL, July 1996

PROFESSIONAL EXPERIENCE

Management Experience:

June 2021-present:

Co-Principal Investigator, Enhance Exotic Plant-Pest Mitigation and Response by Developing New Pest Response Guidelines

- Assists with work plans, progress reports, budget

January 2020-present:

- Journal of Integrated Pest Management reviewer
- SIMPC grant reviewer

July 2019-present:

Principal Investigator, North Carolina 22 Exotic Plant Pest Monitoring (PestLens)

- Manage a team of 3 analysts for an online biosurveillance project that provides early-warning information about quarantine plant-pests critical to the United States Department of Agriculture (USDA)
- Write work plans, progress reports, budget
- Supervise two of the analysts

Mar 1995–Present:

Unit Education and Training Manager and Command Support Staff, North Carolina Air National Guard, 145th Medical Group, Charlotte, NC

- Security clearance: Secret
- Manage a training program for 80 individuals
- Develop, evaluate, administer, organize, and oversee the education and training program in the medical group
- Manage the educational Air Force Training database for the medical group
- Manage the personnel system for the medical group to include the enlisted and officer evaluation program and personnel upgrades
- Executive council contributor—help establish short/long term goals of the medical unit

- Conduct work center visits, monitor progress, identify problem areas, determine causes, recommend corrective action, and provide counsel
- Perform gap analysis to determine where the unit shortfalls are and where further training is needed
- Inspector on Wing Inspection Team—review documents, conduct inspections on other units for inconsistencies, recommend corrective action

Research Experience:

January 2014–present:

Research Scholar, Cooperator with the Center for Integrated Pest Management working with the United States Department of Agriculture (USDA) on the following projects:

- **New Pest Response Guidelines (NPRG)**
  - Research, write and review documents on exotic pests that pose a plant health emergency response to the United States agricultural system
  - Gather information from a wide range of scientific literature to determine pest biology, damage, dispersal, hosts, symptoms and control to either eradicate or contain the newly introduced pest
  - Develop survey techniques and guidelines to delimit the area of a new pest
  - Assist NPRG team members in developing the current NPRG template
- **Other USDA projects**
  - Write and review brief pre-assessments and peer-reviewed technical reports for the New Pest Advisory Group (NPAG) about newly detected pests that have just entered the United States. Provide recommendations on how Plant Protection and Quarantine (PPQ) should proceed in establishing policies for these pests
  - Write technical reports as a Deregulation Evaluation for Established Pests (DEEP) team member to determine if pests, that are already present in the United States, meet the conditions to no longer regulate them
  - Produced and analyzed a pathogen list for a risk assessment of Brazil melon in 2017
    - Compared hosts, plant part affected and damage for old world bollworm and corn earworm (*Helicoverpa armigera* and *H. zea*)
    - Identified cut flower hosts to be exempted in the light brown apple moth (*Epiphyas postvittana*) federal quarantine order in California

June 2010–January 2014:

Research Assistant, Center for Integrated Pest Management

- **Invasive Species Risk Elements**
  - Primary researcher on the Data Archival Retrieval Tool (DART) project; entered data and risk elements from United States Department of Agriculture (USDA) Pest Risk Analysis (PRAs) documents on potential invasive species, requiring an understanding of the PRA workflow/process, and development
- **Global Plant and Disease Database (GPDD)**
  - Developed, edited, analyzed and manipulated data for the GPDD
  - Extracted data from a wide range of literature searches
  - Established protocols for consistent and efficient data collection
  - Administered GPDD meetings and minutes
- **Inspection Services**
  - Worked closely with team members in the GPDD and DART; collaborated with risk analysts of the Animal and Plant Health Inspection Service (APHIS)
  - Verified taxonomy of known and unknown invasive pests

- Completed arthropod pest reviews for Cooperative Agricultural Pest Survey (CAPS) Pest Prioritization Project

Jan 2002–May 2006:

Graduate Research Assistant, University of Florida, Gainesville, FL

- Planned and conducted field, greenhouse, and laboratory experiments to determine the effects of the bioherbicide Smolder™ (*Alternaria destruens*), glyphosate (Roundup Pro®), and ammonium sulfate on dodder (*Cuscuta pentagona*)
- DNA extraction
- Amplified RNA with polymerase chain reaction (PCR)
- PCR purification and phylogenetic analysis
- Field and survey studies

Jan 2000–Dec 2001:

Graduate Research Assistant, North Carolina State University, Raleigh, NC

- Planned and conducted field, greenhouse, and laboratory experiments on biological control agents of weeds using the bacterial pathogens *Pseudomonas syringae* pv. *tagetis* and *Xanthomonas campestris* pv. *poannua*
- Conducted studies on preemergent herbicides in woody ornamental propagation

Other Experience:

Sep 1995–Sep 1999:

Drug Demand Reduction NCO, North Carolina Air National Guard Drug Task Force, Raleigh, NC

- Coordinated and provided educational programs that discussed the dangers of drug use to communities, middle and high schools to include: Community Outreach Projects and camp counselor for D.A.R.E. and Drug Education for Youth (DEFY) camps
- Other duties included the 1997 North Carolina Inaugural Working Committee, which consisted of planning and execution of inaugural events to include the ceremonies, parade, and the Governors reception

Jul 1992–Jan 1995:

Information Management Specialist, Air National Guard Readiness Center (ANGRC), Environmental Department, Andrews Air Force Base, MD

- Monitored approximately 53 million dollars in expenditures between ANGRC and 200 ANG bases as the financial manager for all environmental programs
- Responded and addressed inquiries from ANG bases regarding monetary environmental issues
- Coordinated funds for all environmental requirements once validation had been ascertained
- Database management

PUBLICATIONS

- Cook, J. C., C. Funaro, H. Fang, J. B. van Kretschmar, and R. Hallberg. 2021. New Pest Response Guidelines. *Xanthomonas citri* subsp. *citri* — Citrus canker. U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.
- Cook, J. C., C. Funaro, and L. Quevillon. 2021. New Pest Response Guidelines. *Cocadviroid*: *Coconut cadang-cadang viroid* — Cadang-cadang disease. U.S. Department of

Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.
- Cook, J. C., C. Funaro, and J. B. van Kretschmar. 2021. New Pest Response Guidelines. Citrus leprosis virus complex. U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.
- Cook, J. C., C. Funaro, L. Ferguson, and S. Reddiboyina. 2022. New Pest Response Guidelines. *Potexvirus*: *Citrus yellow vein clearing virus*. U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.
- Cook, J. C., L. Quevillon, and J. B. van Kretschmar. 2022. New Pest Response Guidelines. *Autographa gamma* — Silver Y moth. U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.
- Cook, J. C., L. Quevillon, and J. B. van Kretschmar. 2022. New Pest Response Guidelines. *Tecia solanivora* — Guatemalan potato tuber moth. U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.
- Cook, J. C. and Funaro, C. 2021. New pest response guidelines: *Raffaelea quercivora* (Japanese oak wilt) and *Platypus quercivorus* (oak ambrosia beetle). United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine.
- Cook, J. C., C. Funaro, and J. B. van Kretschmar. 2021. New pest response guidelines. *Begomovirus*: Cotton leaf curl Gezira virus. U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.
- Cook, J. C., C. Funaro, and J. B. van Kretschmar. 2021. New pest response guidelines. *Begomovirus*: Okra yellow mosaic Mexico virus. U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.
- Cook, J. C., C. Funaro, J. B. van Kretschmar, and H. Fang. 2021. New pest response guidelines. Citrus leprosis virus complex (CiLV). U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.
- Cook, J. C., C. Funaro, J. B. van Kretschmar, R. Hallberg, and H. Fang. 2021. New pest response guidelines. *Xanthomonas citri* subsp. *citri* (citrus canker). U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.
- Cook, J. C., C. Funaro, J. B. van Kretschmar, R. Hallberg, and C. Hicks. 2021. New pest response guidelines. *Hemileia vastatrix* Berk. & Broome (coffee leaf rust). U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.
- Cook, J. C., C. Funaro, J. B. van Kretschmar, and T. Culliney. 2021. New pest response guidelines. *Cydalima perspectalis* (Lepidoptera: Crambidae) (Walker, 1859) (box tree moth). U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.
- Hardin, T., D. McPhie, J. C. Cook, and C. Funaro. 2021. New pest response guidelines. *Oxycarenus hyalinipennis* (Costa) (cotton seed bug). U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.
- Cook, J. C. 2020. New pest response guidelines. '*Candidatus* Phytoplasma palmae'-related strain (16SrIV-D) (lethal bronzing disease). U.S. Department of Agriculture, Animal

Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.

- Cook, J. C., C. Funaro, J. B. van Kretschmar, G. R. Pallipparambil, and H. Fang. 2020. New pest response guidelines. *Helicoverpa armigera* (Hübner) (Old World bollworm). U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.
- Cook, J. C. 2020. New pest response guidelines. '*Candidatus* Phytoplasma prunorum'-Seemüller and Schneider (European stone fruit yellows). U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.
- Cook, J. C. 2020. New pest response guidelines. *Meloidogyne fallax* Karssen (false Columbia root-knot nematode). U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.
- Cook, J. C. 2020. New pest response guidelines. *Ralstonia solanacearum* (Smith, 1896) Yabuuchi et al., 1996 "race 3 biovar 2" (brown rot of potato). U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.
- Cook, J. C., C. Funaro, J. B. van Kretschmar and G. R. Pallipparambil. 2020. New pest response guidelines. *Tobamovirus*: Tomato brown rugose fruit virus. U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.
- Cook, J. C. 2019. New pest response guidelines. *Anguina tritici* (Steinbuch, 1799) Chitwood, 1935 (wheat gall nematode). U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.
- Cook, J. C. 2019. New pest response guidelines. *Magnaporthiopsis maydis* (Samra, Sabet & Hing.) Klaubauf, Lebrun & Crous (late wilt of corn). U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.
- Cook, J. C. 2019. New pest response guidelines. *Pseudomonas syringae* pv. *actinidiae* Takikawa, Serizawa, Ichikawa, Tsuyumu and Goto 1989 (bacterial canker of kiwifruit). U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.
- Cook, J. C. 2019. Response plan. Tomato brown rugose fruit virus (ToBRFV). U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.
- Cook, J. C. and J. B. van Kretschmar. 2019. New pest response guidelines. '*Candidatus* Phytoplasma solani' Quaglino et al. ("Bois noir"). U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.
- Cook, J. C. and J. B. van Kretschmar. 2019. New pest response guidelines. *Mandavirus*: Citrus yellow vein clearing virus. U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.
- Cook, J. C. and J. B. van Kretschmar. 2018. New pest response guidelines. '*Candidatus* Phytoplasma vitis' (16SrV-C and 16SrV-D) IRPCM 2004 (grapevine flavescence dorée). U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.
- Cook, J. C. and J. B. van Kretschmar. 2018. New pest response guidelines. *Cryptoblabes gnidiella* (Lepidoptera: Pyralidae) (Millière, 1867) (Christmas berry webworm). U.S.

Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.

- Cook, J. C. and J. B. van Kretschmar. 2018. New pest response guidelines. *Halotydeus destructor* (Tucker) (redlegged earth mite). U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.
- Cook, J. C. and J. B. van Kretschmar. 2018. New pest response guidelines. *Laodelphax striatellus* (Fallén, 1826) (small brown planthopper). U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.
- Cook, J. C. and J. B. van Kretschmar. 2018e. New pest response guidelines. *Paysandisia archon* (Burmeister) (South American palm borer). U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.
- Cook, J. C. and J. B. van Kretschmar. 2018. New pest response guidelines. *Rhagoletis cerasi* (Linnaeus) (European cherry fruit fly). U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.
- Cook, J. C. and J. B. van Kretschmar. 2018. New pest response guidelines. *Thecaphora frezzii* Carranza & J. C. Lindq. (peanut smut). U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.
- Cook, J. C. and J. B. van Kretschmar. 2018h. New pest response guidelines. *Xylella fastidiosa* Wells et al. subsp. *pauca* (Schaad et al.) (citrus variegated chlorosis). U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.
- Bloem, S., J. C. Cook, G. R. Pallipparambil, E. Spaltenstein, and J. B. van Kretschmar. 2017. New pest response guidelines. *Tuta absoluta* (Meyrick) (tomato leafminer). U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.
- Cook, J. C. 2017. New pest response guidelines. *Dickeya solani* sp. nov. van der Wolf et al. (potato blackleg). U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.
- Cook, J. C. 2017. Preliminary New Pest Response Assessment. *Magnaporthiopsis maydis* (Samra, Sabet & Hing.) Klaubauf, Lebrun & Crous (=*Harpophora maydis* (Samra, Sabet & Hing.) W. Gams) (Klaubauf et al., 2014) (late wilt of corn). U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.
- Cook, J. C. 2017. New pest response guidelines. *Synchytrium endobioticum* (Schilb.) Percival (potato wart disease). U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.
- Cook, J. C. 2017. New pest response guidelines. *Xanthomonas oryzae* (ex Ishiyama 1922) Swings et al. 1990 (bacterial blight and bacterial leaf streak of rice). U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.
- Cook, J. C. 2017. Preliminary New Pest Response Assessment. *Phytophthora kernoviae* Brasier, Beales & S.A. Kirk (beech bleeding canker). U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.
- Cook, J. C., and J. B. van Kretschmar. 2017. New pest response guidelines. '*Candidatus* Phytoplasma phoenicium' Verdin et al. (almond witches' broom). U.S. Department of

Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.

- Cook, J. C., and J. B. van Kretschmar. 2017. New pest response guidelines. *Eurygaster integriceps* Puton (Hemiptera: Scutelleridae) (sunn pest). U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.
- Cook, J. C., and J. B. van Kretschmar. 2017. New pest response guidelines. *Thaumatotibia leucotreta* (Meyrick) (false codling moth). U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.
- Cook, J. C. 2015. Deregulation evaluation for established pests report: *Ascochyta buxina* Saccardo. United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine, Center for Plant Health Science and Technology, Plant Epidemiology and Risk Analysis Laboratory.
- Cook, J. C. 2015. Deregulation evaluation for established pests report: *Puccinia kuehnii* (W. Krüger) E.J. Butler**:** Orange rust of sugarcane. United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine, Center for Plant Health Science and Technology, Plant Epidemiology and Risk Analysis Laboratory.
- Cook, J. C. 2015. Deregulation evaluation for established pests report: *Peronospora digitalis* Gäumann: Downy mildew of foxglove. United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine, Center for Plant Health Science and Technology, Plant Epidemiology and Risk Analysis Laboratory.
- Cook, J. C. and B. D. Wiseborn. 2015. New pest response guidelines: Teleomorph: *Magnaporthe oryzae* B.C. Couch *Triticum* pathotype; Anamorph: *Pyricularia oryzae* Cavara (wheat blast). United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine.
- Cook, J. C. 2015. New pest response guidelines: *Peronosclerospora philippinensis* (W. Weston) C.G. Shaw (Philippine downy mildew). United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine.
- Cook, J. C. 2015. New pest response guidelines: *Raffaelea quercivora* Kubono & Shin. Ito (Japanese oak wilt). United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine.
- Cook, J. C. 2014. Deregulation evaluation for established pests report: Blueberry scorch virus (BlScV). United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine, Center for Plant Health Science and Technology, Plant Epidemiology and Risk Analysis Laboratory.
- Cook, J. C. 2014. Deregulation evaluation for established pests report: *Colletotrichum phormii* (Henn.) D.F. Farr & Rossman: Leaf spot on phormium. United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine, Center for Plant Health Science and Technology, Plant Epidemiology and Risk Analysis Laboratory.
- Cook, J. C. 2014. Deregulation evaluation for established pests report: *Phoracantha recurva* Newman (yellow longicorn). United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine, Center for Plant Health Science and Technology, Plant Epidemiology and Risk Analysis Laboratory.
- Cook, J. C. and S. Costanzo. 2014. New pest response guidelines: *Coniothyrium glycines* (R.B. Stewart) Verkley & Gruyter 2012 (red leaf blotch of soybean). United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine.
- Cook, J. C. and B. D. Wiseborn. 2014. New pest response guidelines: *Ditylenchus angustus* (Butler) Filipjev (rice stem or ufra nematode). United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine.

- Cook, J., R. Charudattan, T. W. Zimmerman, E. N. Rosskopf, W. M. Stall, and G. E. MacDonald. 2009. “Effects of *Alternaria destruens*, glyphosate, and ammonium sulfate individually and integrated for control of dodder (*Cuscuta pentagona*).” *Weed Tech*. 23:550-555.
- Eckroat, L. E., E. C. Masteller, J. C. Shaffer, and L. M. Steele. 1993. “The byssus of the zebra mussel (*Dreissena polymorpha*): Morphology, byssal thread formation, and detachment.” Pp. 239-263 in *Zebra Mussels: Biology, Impacts, and Control*, edited by T. F. Nalepa and D. W. Schloesser. Florida: Lewis Publishers.

PRESENTATIONS

Cook J., R. Charudattan, E. Rosskopf, T. Zimmerman, G. MacDonald, and W. Stall. 2004. “Integrated control of dodder (*Cuscuta pentagona*) using glyphosate, ammonium sulfate and the biological control agent *Alternaria destruens*.” *Proc. 40th Caribbean Food Crops Society*. 40:102-104.

Cook, J. C. and J. C. Neal. 2001. “Comparison of *Pseudomonas syringae* pv. *tagetis* efficacy on *Asteraceae* weeds.” *Proc. Weed Science Soc. of Amer*. 41:52.

Cook, J. C. and J. C. Neal. 2001. “Effects of herbicides and application timing on rooting of azalea and Japanese holly cuttings.” *Proc. Southern Nursery Assoc. Res. Conf*. 46:422-424.

Cook, J. C. and J. C. Neal. 2001. “Variation in response of sunflower cultivars to *Pseudomonas syringae* pv. *tagetis*.” *Proc. Northeastern Weed Sci Soc*. 55:35.

Cook, J. C., J. C. Neal, and F. H. Yelverton. 2000. “*Xanthomonas campestris* pv. *poannua* efficacy on the annual biotype of *Poa annua*.” *Proc. Northeastern Weed Sci Soc*. 54:68.

TRAINING & DEVELOPMENT

- **Risk Analysis 101**, United States Department of Agriculture, PPQ-CPHST, Plant Epidemiology & Risk Analysis Laboratory, August 2011
- Individual to Leadership (i2L) Program, August 2019
- Individual to Leadership (i2L) Emotional Intelligence for Leadership Mini-Course, September 2020

PROFESSIONAL MEMBERSHIPS

- North Carolina National Guard Association
- Pi Alpha Xi
- The Enlisted Association of the National Guard of the United States

AWARDS AND HONORS

- Florida Weed Science Society Outstanding Graduate Student Award (2004)
- University of Florida Presidential Recognition (2005)

Hui Fang, PhD

Research Scholar
NSF Center for Integrated Pest Management
College of Agriculture and Life Sciences,
North Carolina State University, Raleigh, NC 27606
Email: hfang4@ncsu.edu

Educational Background

- • **Ph.D.**, 2013, in Plant and Environmental Sciences, New Mexico State University, Las Cruces, NM

Dissertation: Mapping quantitative trait loci (QTL) for resistance to Verticillium wilt using a backcross inbred line and a recombinant inbred line population in cotton.

- • **M.S.**, 2004, in Plant Pathology, Yunnan Agricultural University, Kunming, China

Thesis: Population structure of genetic diversity for rice blast control and its ecological mechanisms.

- • **B.S.**, 1992, in Plant Protection, Yunnan Agricultural University, Kunming, China

Employment History

- • North Carolina State University, Center for Integrated Pest Management Raleigh, North Carolina

Research Scholar May 2018 - present

- • North Carolina State University, Dept. of Crop & Soil Sciences Raleigh, North Carolina

Research Specialist Dec. 2015 – May 2018

- • North Carolina State University, Dept. of Crop Science Raleigh, North Carolina

Post-Doctoral Research Associate July 2013 – Nov. 2015

- • New Mexico State University, Dept. of Plant & Environmental Sciences Las Cruces, New Mexico

Research Assistant / Teaching Assistant 2009 - 2013

- • Xishuangbanna Tropical Botanical Garden, the Chinese Academy of Sciences Kunming, China

Research Associate 2004 - 2008

- • Yunnan Agricultural University Kunming, China

Research Assistant / Teaching Assistant 2001 - 2004

- • Yunnan Vocational and Technical College of Agriculture Kunming, China

Lecturer 1992 - 2001

Research

- • In collaboration with the U.S. Department of Agriculture APHIS PPQ PPRA and ARS, my current research involves in the pest delimitation modeling, pest delimiting survey design, development of survey tools and new pest response guidelines, and pest exclusion analysis.
- • Cotton breeding and genetics with extensive applications of genomic tools and approaches including quantitative trait loci (QTL) mapping, genome-wide association studies

(GWAS), genotyping by sequencing (GBS), next generation sequencing (NGS), and high throughput phenotyping.

- • Cotton genomics, genomic prediction and marker assisted selection.
- • Breeding cotton varieties with high yield and improved fiber quality via traditional and molecular techniques.
- • Molecular markers development and application.

- • Etiology of fungal disease (symptomatology and causal agents of diseases).
- • Plant disease control (disease resistance screening, disease management via biodiversity intercropping, soil phytoremediation).
- • Arbuscular mycorrhizal fungi and their functions in ecosystem and sustainable agriculture.

Professional Experience and Accomplishments

Research Scholar: May 2018 – Present, NSF Center for Integrated Pest Management, North Carolina State University – Raleigh, NC

Conduct research on development of exotic pest delimitation survey tools and new pest response guidelines, exotic pest delimitation modeling, pest exclusion analysis, and pest delimiting survey designs by using different software packages including R, Power BI, Python, TrapGrid, Microsoft Excel, SAS, and JMP.

Accomplishments:

- • Developed Excel based delimitation survey design and mapping tools which transferred complicated mathematical calculations to just a few clicks and easy to use by field survey managers.
- • Developed a novel, improved delimiting trapping survey design (Core-&-Perimeter circular design) for insect pests. This design can proportionally reduce 37-54% of the trapping area and total traps.
- • Investigated the effectiveness of conventional 5-mile-by-5-mile delimiting survey grid for leek moth and 9-mile-by-9-mile survey grid for Medfly and proposed several improved grid designs that could reduce total cost by 86% for the leek moth and 91% for the Medfly.
- • Design pest delimiting survey plans for New Pest Response Guidelines (NPRG) and assisted developing delimiting surveys using “core-&-perimeter” design for more than 10 exotic insect pests.
- • Develop tools for visual delimitation survey for immobile pests (pathogens, weeds, mollusks, etc.) (Ongoing)
- • Wrote multiple manuscripts and government reports based on research findings.

Research Specialist: Dec. 2015 - May 2018, North Carolina State University - Raleigh, NC

Took charge of the construction of the largest nested association mapping (NAM) populations in cotton thus far; conducted research on genome-wide association studies (GWAS) using the cutting-edge genotyping by sequencing (GBS) technology through next generation sequencing (NGS) platform to dissect the genetic basis of agronomically important complex traits; bred cotton cultivars with high yield, high fiber quality and resistance to diseases and insect pests; constructed high-density linkage map and identified QTLs for fiber quality, yield, and morphological traits using CottonSNP63K array; screened cotton germplasm and quantified components contributing to thrips resistance in cotton; mentored, supervised, and trained more than 20 undergraduates and temporary employees; communicated research findings in professional conferences and published papers in peer-referred journals.

Accomplishments:

- • Led a multi-institutional project on genome-wide association studies (GWAS) which involved evaluating more than 400 lines of North American cotton across 6 states in the U.S. to genetically map various agronomic traits of economic importance.
- • Released 10 upland cotton lines with either high yield or high fiber quality traits or the combination of both, which led to three publications in *Journal of Plant Registrations*.
- • Developed of a nested association mapping (NAM) population with 4200 inbred lines and managed the

- project exceedingly well by advancing the mapping populations in both field and greenhouse settings.
- • Constructed high-density SNP-based linkage maps and identified 106 QTLs controlling important cotton traits (59 QTLs for six fiber quality traits, 38 QTLs for four yield traits and 9 QTLs for two morphological traits) using a recombinant inbred line (RIL) population consisting 107 upland lines.
- • Screened 391 upland cotton accessions and 34 Pima cotton accessions for thrips resistance under field conditions and identified 10 resistant and moderately assistant accessions, which can be used to study the inheritance of trips.
- • Assisted in analyzing cotton genes with a diverse array of genomic and molecular tools and elucidated that the multi-allelic, major leaf shape locus *L-D1* of cotton is governed by the HD-Zip transcription factor *GhLMI1-D1b*. This breakthrough finding was published in a *PNAS* paper, on which I am a coauthor.
- • Mentored and supervised 20 student research assistants by training them appropriately and assigning the work effectively.
- • Evaluated an upland cotton diversity panel and identified seven cotton elite lines with high level of resistance to bacterial leaf blight (BLB) disease.
- • Constructed seven recombinant inbred line (RIL) populations with 120 lines in each population. The elite lines in these populations contain high level of resistance to bacterial leaf blight (BLB) of cotton and will be used to map resistance genes and to breed cultivars resistant to BLB.
- • Successfully controlled diseases, insect pests and weeds in the greenhouse and field through integrated pest management (IPM) strategies.

Postdoc: July 2013 - Dec. 2015, North Carolina State University - Raleigh, NC
Genome-wide association studies (GWAS) based on linkage disequilibrium (LD) provides a promising tool for detection and fine mapping of the quantitative trait loci (QTL) underlying complex agronomic traits. My research focused on constructing the largest immortal nested association mapping (NAM) population in cotton, which would ultimately help to bridge genomics and plant breeding through the dissection of complex traits and laying the foundation for genome-wide selection in breeding programs. Selected and bred elite cotton lines with high fiber yield, high fiber quality traits, and high level of resistance to diseases and pest insects.
Accomplishments:

- • Evaluated a cotton diversity panel containing more than 400 accessions for fiber quality, yield, and flowering time at different locations in multiple years; successfully increased seeds for this panel through manually self-pollination.
- • Genotyped the Upland cotton diversity panel containing more than 400 accessions through genotyping by sequencing (GBS) based on next generation sequencing (NGS) platform; called the single nucleotide polymorphism (SNP) markers that will be used for genome-wide association studies (GWAS) to dissect the quantitative trait loci (QTL) underlying the economically important complex traits, including yield and fiber quality.

- • Developed the largest nested association mapping (NAM) population in upland cotton so far, which contains 44 families with more than 4,200 recombinant inbred lines (RILs).
- • Supervised and directed students and temporary employees to effectively finish research work in time.
- • Successfully controlled diseases, insect pests and weeds through integrate pest management (IPM) strategy in both the field and greenhouse.

Senior Research Assistant: Jan. 2011 - May 2013, New Mexico State University - Las Cruces, NM
Accomplishments:

- • Key contributor of the research project titled 'Genetic Improvement of Cotton Germplasm for New Mexico', sponsored by National Institute of Food and Agriculture.
- • Developed a series of molecular markers, including amplified fragment length polymorphism (AFLP), resistance gene analogue (RGA)-AFLP, simple sequence repeat (SSR), and single nucleotide polymorphisms (SNPs) to constructed linkage genetic maps.
- • Conducted the first study to map QTL conferring resistance to Verticillium wilt (VW) using a recombinant inbred line (RIL) population within Upland cotton and detected 21 QTLs for VW resistance.
- • Identified 3 QTLs conferring resistance to VW in a backcross inbred line (BIL) population for the first time and identified 3 QTLS for VW resistance on the same chromosome using both the BIL and RIL populations in the greenhouse and field tests.
- • Cloned and sequenced 54 resistance gene analogue-amplified fragment length polymorphism (RGA-AFLP) markers; converted 7 RGA-AFLP markers to sequence-tagged sites (STS) markers in a backcross inbred line (BIL) population and generated 4 STS markers in the recombinant inbred line (RIL) population.
- • Screened more than 1000 cotton accessions for diseases and insect pest resistance in cotton in the greenhouse.
- • Assisted in the effective management of cotton breeding programs and production, such as experimental design, seed packing, planting, emasculating and hybridizing, data collecting, boll sampling and harvesting.
- • Investigated, collected, and statistically analyzed experimental data to write manuscripts for publication.

Research / Teaching Assistant: Jan. 2009 - Dec. 2010, New Mexico State University - Las Cruces, NM
Accomplishments:

- • **Research Assistant:** Roche 454 next generation sequencing facility, New Mexico State University (2010)

Synthesized cDNA, prepared libraries, conducted titration, ran emulsion (em)PCR, and successfully sequenced genomes via Roche 454 GS FLX next generation sequencer.

- • **Teaching Assistant:** Department of Biology, New Mexico State University

Taught an experimental class, ***Cellular and Organismal Biology*** (BIO211) at undergraduate level, and directed more than100 students finishing their projects on diabetes from writing proposal to data collection, data analysis, and poster preparation.

- • Served as judge of poster competition of undergraduates for their diabetes projects.

Research Associate: July 2004 - Dec. 2008, Xishuangbanna Tropical Botanical Garden, the Chinese Academy of Sciences, Kunming, China
Accomplishments:

• Served as principal investigator (PI) and Co-PI of several interdisciplinary projects, including 'Diversity of arbuscular mycorrhizal fungi of epiphytes in forest canopies in Ailao Mountains in Yunnan', 'Study of arbuscular mycorrhizal fungi and bioremediation of heavy metal mine areas in Yunnan, China', and 'Mycorrhizal association patterns in successional /secondary forests in Xishuangbanna, Southwest China'
• Prepared effective project proposals and work plans to achieve successful outcomes.
• Participated in successful management and accomplishment of several important projects, such as '973 Program (Hi-Tech)', supported by the Ministry of Science and Technology of China.

• Studied the diversity and dynamics of arbuscular mycorrhizal fungi (AMF) microbiota in the tropical and subtropical forest in China and found that the AMF microbiota affects the structure and diversity of associated natural and agricultural plant communities.

• Supervised and assisted directing graduate students finishing their research projects and theses.

Graduate Assistant: Sept. 2001- July 2004, Yunnan Agricultural University, Kunming, China
Accomplishments:

• Conducted effective research on plant disease control through biodiversity, focusing on rice blast control in several important projects funded by the Ministry of Agriculture of China and the Ministry of Science and Technology of China.
• Participated in successful management and accomplishment of several important projects on plant diseases control through biodiversity, including '863 Program (Hi-Tech)', funded by the Ministry of Science and Technology of China and the Ministry of Agriculture of China.
• Invented a patent: Diversity konjaku and corn planting method capable of controlling soft rot of konjaku (Patent No.: ZL 200310110792.X).

Lecturer: July 1992 - Aug. 2001, Yunnan Vocational and Technical College of Agriculture, Kunming, China
Accomplishments:

• Finished more than 2,000 credit hours of teaching in both theory and practice of *Plant Pathology*, *Genetics*, and *Plant Breeding* at undergraduate level.
• Directed more than 1,000 students finished their practical training for graduation.
• Served as class advisor for 3 years, supervised 40 students finishing their studies for graduation.
• Saved as research specialist and provided technical support for the orchard and farm of the college. Doubled the income of the college orchard and farm in a year.

Teaching Experience

1. Completed more than 350 credit hours in teaching an experimental class, *Cellular and Organismal Biology* at undergraduate level, and supervised 100 undergraduates to finish projects on diabetes.
2. Taught both theory and practice of *Plant Pathology*, *Genetics*, and *Plant Breeding* at undergraduate level and finished more than 2,000 credit hours in these subjects.

Honors and Awards

1. Nominated for the U.S. Department of Agriculture-Plant Protection and Quarantine (PPQ) Safeguarding Award

2. Award of “Excellent Class Advisor”, Yunnan Vocational and Technical College of Agriculture, 1996
3. Scholarship for excellent achievement for graduates, Yunnan Agricultural University, 2003, 2002
4. Excellence of Mid-term Assessment, Yunnan Agricultural University, 2003

Professional Services

Associate Editor, *Euphytica* (2022 - present)
Senior Editor, *Plant Disease* (2016 - 2018)
Have reviewed more than 30 papers for peer-reviewed journals including *PLoS ONE, BMC Genomics, Plant Disease, Euphytica, Crop Science, Industrial Crops and Products*, and *Frontiers in Plant Science*.

Selected Publications

• Patent

Zhu, Y.Y., H.P. Zhou, L. Peng, Y.Y. Wang, **H. Fang**, X.H. He, Y Li, Z.S. Li, and H. Cai. 2006. Diversity konjaku and corn planting method capable of controlling soft rot of konjaku. Patent No.: ZL 200310110792.X.

• **Book chapters (Severed on editorial committee for two books)**

1. **Fang, H**., et al. The Ecological Basis of Genetic Diversity for Crop Disease Control. In Zhu, Y.Y. ed. Genetic Diversity for Crops Diseases Sustainable Management. Science Press, Beijing, 2007.
2. **Fang, H**., et al. The Application Study on Optimization Colony Cultivation Pattern of Genetic Diversity for Crop Disease. In Zhu, Y.Y. ed. Genetic Diversity for Crops Diseases Sustainable Management. Science Press, Beijing, 2007.
3. **Fang, H**., et al. Demonstration and Extension on Technology of Genetic Diversity for Crop Disease Sustainable Control. In Zhu, Y.Y. ed. Genetic Diversity for Crops Diseases Sustainable Management. Science Press, Beijing, 2007.
4. **Fang, H**., et al. The Mechanisms of Biodiversity for Sustainable Diseases Management. In Zhu, Y.Y. ed. Biodiversity for Sustainable Crop Diseases Management: Theory and Technology. Yunnan Science and Technology Press. Kunming, 2004.
5. **Fang, H**., et al. The Field Experimental Trials of Biodiversity for Sustainable Diseases Management. In Zhu, Y.Y. ed. Biodiversity for Sustainable Crop Diseases Management: Theory and Technology. Yunnan Science and Technology Press. Kunming, 2004.
6. **Fang, H**., et al. Demonstrations and Extension of Biodiversity for Sustainable Diseases Management. In Zhu, Y.Y. ed. Biodiversity for Sustainable Crop Diseases Management: Theory and Technology. Yunnan Science and Technology Press. Kunming, 2004.

• Government Reports

1. **H. Fang**, Caton, B.P., N.C. Manoukis, and G.R. Pallipparambil. 2022. Simulation-Based Investigation of Trapping Transects for Area-Wide Delimitation Surveys. Plant Protection and Quarantine (PPQ), Animal and Plant Health Inspection Service, U.S. Department of Agriculture; Agricultural Research Service (ARS), U.S. Department of Agriculture; Center for Integrated Pest Management (CIPM), North Carolina State University, Raleigh, NC. p. 17.
2. Caton, B.P., G.R. Pallipparambil, and **H. Fang**. 2022. A Proposed Novel Design for Visual Delimiting Surveys for Plant Pests. Plant Protection and Quarantine (PPQ), Animal and Plant Health Inspection Service, U.S. Department of Agriculture; Center for Integrated Pest Management (CIPM), North Carolina State University, Raleigh, NC. 21 pp.
3. Caton, B.P., **H. Fang**, N.C. Manoukis, and G.R. Pallipparambil. 2021. Creating Delimiting Trapping Surveys for Insects and Other Mobile Plant Pests Using the Core-and-Perimeter Design. Plant Protection and Quarantine (PPQ), Animal and Plant Health Inspection Service, U.S. Department of Agriculture; Agricultural Research Service (ARS), U.S. Department of

Agriculture; Center for Integrated Pest Management (CIPM), North Carolina State University, Raleigh, NC. p. 36.
4. Caton, B.P., **H. Fang**, and G.R. Pallipparambil. 2021. Simulation-Based Investigation of Visual Surveys for Plant Pests. Plant Protection and Quarantine (PPQ), Animal and Plant Health Inspection Service, U.S.

Department of Agriculture; Agricultural Research Service (ARS), U.S. Department of Agriculture; Center for Integrated Pest Management (CIPM), North Carolina State University, Raleigh, NC. p. 16.
5. Caton, B.P., G.R. Pallipparambil and **H. Fang**. 2021. Line Transect Versus Area Survey Methods for Delimitation. Plant Protection and Quarantine (PPQ), Animal and Plant Health Inspection Service, U.S. Department of Agriculture; Center for Integrated Pest Management (CIPM), North Carolina State University. p. 5.
6. van Kretschmar, J.B., C. Funaro, J.C. Cook, G.R. Pallipparambil and **H. Fang**. 2021. New Pest Response Guidelines. *Helicoverpa armigera*—Old world bollworm. U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C. p. 56.
7. **Fang, H**. 2020. Objective Prioritization of Exotic Pests (OPEP) impact assessment for *Xylophilus ampelinus* (Comamonadaceae): Bacterial blight of grapevine. United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine (PPQ), Raleigh, NC. p.11.
8. Caton, B.P., **H. Fang**, N.C. Manoukis, and G.R. Pallipparambil. 2020. Analysis of Survey Trapping Detections Data for Insects to Describe and Validate Dispersal Abilities. Plant Protection and Quarantine (PPQ), Animal and Plant Health Inspection Service, U.S. Department of Agriculture; Agricultural Research Service (ARS), U.S. Department of Agriculture; Center for Integrated Pest Management (CIPM), North Carolina State University, Raleigh, NC. p. 33.
9. Caton, B.P., **H. Fang**, N.C. Manoukis, and G.R. Pallipparambil. 2020. Simulation-based analysis of nine-mile-by-nine-mile fruit fly trapping grids. Plant Protection and Quarantine (PPQ), Animal and Plant Health Inspection Service, U.S. Department of Agriculture; Agricultural Research Service (ARS), U.S. Department of Agriculture; Center for Integrated Pest Management (CIPM), North Carolina State University. p. 14.
10. Caton, B.P., **H. Fang**, N.C. Manoukis, and G.R. Pallipparambil. 2020. Simulation Analysis of the Performance of Detection Trapping Surveys for the European Grapevine Moth in California, and Seasonality of Detections. Plant Protection and Quarantine (PPQ), Animal and Plant Health Inspection Service, U.S. Department of Agriculture; Agricultural Research Service (ARS), U.S. Department of Agriculture; Center for Integrated Pest Management (CIPM), North Carolina State University, Raleigh, NC. p. 13.
11. Caton, B.P., **H. Fang**, N.C. Manoukis, and G.R. Pallipparambil. 2020. Comparison of Correlated-Random-Walk Based and Diffusion Based Insect Pests Trapping— Simulation Based Analysis. Plant Protection and Quarantine (PPQ), Animal and Plant Health Inspection Service, U.S. Department of Agriculture; Agricultural Research Service (ARS), U.S. Department of Agriculture; Center for Integrated Pest Management (CIPM), North Carolina State University, Raleigh, NC. p. 11.
12. Cook, J.C., **H. Fang**, C. Funaro, J.B. van Kretschmar. 2021. New Pest Response Guidelines. Citrus leprosis virus complex. U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C. p.56.
13. Cook, J.C., **H. Fang**, C. Funaro, R. Hallberg, J.B. van Kretschmar. 2021. New Pest Response Guidelines. *Xanthomonas citri* subsp. *citri*—Citrus canker. U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C. p.51.

14. Caton, B.P., **H. Fang**, N.C. Manoukis, and G.R. Pallipparambil. 2020. A Novel, Improved Delimiting Trapping Survey Design for Insect Pests. Plant Protection and Quarantine (PPQ), Animal and Plant Health Inspection Service, U.S. Department of Agriculture; Agricultural Research Service (ARS), U.S. Department of Agriculture; Center for Integrated Pest Management (CIPM), North Carolina State University, Raleigh, NC. p. 27.

15. Caton, B.P., **H. Fang**, N.C. Manoukis, and G.R. Pallipparambil. 2019. How effective is the five-mile-by-five-mile grid for insect trapping? —A simulation-based investigation. Plant Protection and Quarantine (PPQ), Animal and Plant Health Inspection Service, U.S. Department of Agriculture; Agricultural Research Service (ARS), U.S. Department of Agriculture; Center for Integrated Pest Management (CIPM), North Carolina State University, Raleigh, NC. p. 13.
16. Caton, B.P., **H. Fang**, N.C. Manoukis, and G.R. Pallipparambil. 2019. Simulation-based optimization of delimitation trapping surveys for insect pests. Plant Protection and Quarantine (PPQ), Animal and Plant Health Inspection Service, U.S. Department of Agriculture; Agricultural Research Service (ARS), USDA; Center for Integrated Pest Management (CIPM), North Carolina State University. p. 22.

• Refereed publications

1. **Fang**, **H.**, B.C. Caton, N.C. Manoukis, G.R. Pallipparambil. 2022. Simulation-Based Evaluation of Two Insect Trapping Grids for Delimitation Surveys. *Scientific Reports*. 12:11089. https://doi.org/10.1038/s41598-022-14958-5.
2. Gowda, S. Anjan, N. Shrestha, T.M. Harris, A.Z. Phillips, **H. Fang**, S. Sood, K. Zhang, F. Bourland, R. Bart, V. Kuraparthy. 2022. Identification and genomic targeting of major effect bacterial blight resistance gene (*BB-13*) in Upland cotton (*Gossypium hirsutum* L.). *Theoretical and Applied Genetics*. https://doi.org/10.1007/s00122-022-04229-2
3. Caton, B.C., **H. Fang**, N.C. Manoukis, G.R. Pallipparambil. 2021. Quantifying insect dispersal distances from trapping detections data to predict delimiting survey radii. *Journal of Applied Entomology*. 1-14, https://doi.org/10.1111/jen.12940.
4. Caton, B.C., **H. Fang**, N.C. Manoukis, G.R. Pallipparambil.2021. Simulation-based investigation of the performance of delimiting trapping surveys for insect pests. *Journal of Economic Entomology*. 114(6):2581-2590.
5. **Fang**, **H.**, K. Zhang, D.T. Bowman, D.C. Jones, V. Kuraparthy. 2021. Registration of two high lint yield and high elongation germplasm lines of upland cotton. *Journal of Plant Registrations*. 15:359-365.
6. **Fang**, **H.**, K. Zhang, D.T. Bowman, D.C. Jones, V. Kuraparthy. 2019. Registration of Four High Lint Yield Germplasm Lines of Upland Cotton. *Journal of Plant Registrations*. 13: 396-400.
7. **Fang**, **H.**, D.T. Bowman, K. Zhang, L. Zhu, D.C. Jones, V. Kuraparthy. 2019. Registration of four high fiber quality germplasm lines of upland cotton. *Journal of Plant Registrations*. 13: 401-405.
8. Zhang, K., V. Kuraparthy, **H. Fang**, L. Zhu, S. Sood, D.C. Jones. 2019. High-density linkage map construction and QTL analyses for fiber quality, yield and morphological traits using CottonSNP63K array in Upland cotton (*Gossypium hirsutum* L.). *BMC Genomics*. (2019) 20:889.
9. Andres, R., V. Coneva, M.H. Frank, R. Tuttle, S.W. Han, L.F.S. Lopez, B. Kaur, L.L. Zhu, **H. Fang**, D. Bowman, M. Rojas-Pierce, C. Haigler, D. Jones, J.B. Holland, D.H. Chitwood, V. Kuraparthy. 2017. Modifications to a *LATE MERISTEM IDENTITY-1* gene are responsible for the major leaf shapes of Upland cotton (*Gossypium hirsutum* L.). *Proc. Natl. Acad. Sci. U.S.A.* (PNAS). 114 (1): E57-E66.

10. Li, M., H. An, R. Angelovici, C. Bagaza, A. Batushansky, L. Clark, V. Coneva, M. Donoghue, E. Edwards, D. Fajardo, **H. Fang**, M. Frank, T. Gallaher, S. Gebken, T. Hill, S. Jansky, B. Kaur, P. Klahs, L. Klein, V. Kuraparthy, J. Londo, Z. Migicovsky, A. Miller, R. Mohn, S. Myles, W. Otoni, J.C.Pires, E. Riffer, S. Schmerler, E. Spriggs, C. Topp, A.V. Deynze, K. Zhang, L.L. Zhu, B.M. Zink, D.H. Chitwood. 2018. Topological Data Analysis as a Morphometric Method: Using Persistent Homology to Demarcate a Leaf Morphospace*. Frontiers in Plant Science*. 9(553).

11. Kaur, B, V. Kuraparthy, J. Bacheler, **H. Fang**, D.T. Bowman, 2018. Screening Germplasm and Quantification of Components Contributing to Thrips Resistance in Cotton. *Journal of Economic Entomology*. 111(5): 2426-2434.

12. **Fang, H.,** H.P. Zhou, S. Sanogo, A.E. Lipka, D.D. Fang, R.G. Percy, P.S. Hughs, D.C. Jones, M.A. Gore, and J.F. Zhang. 2014. Quantitative trait locus analysis of Verticillium wilt resistance in an introgressed recombinant inbred population of Upland cotton. *Molecular Breeding*. 33(3): 709-720.

13. Fang, **H.,** H.P. Zhou, S. Sanogo, and J.F. Zhang. 2014. Development of STS markers for Verticillium wilt resistance in cotton based on RGA-AFLP analysis. *Molecular Breeding.* 34(3): 917-726.

14. **Fang, H.,** H.P. Zhou, S. Sanogo, R. Flynn, R.G. Percy, S.E. Hughs, M. Ulloa, D.C. Jones, and J.F. Zhang. 2013. Quantitative trait locus mapping for Verticillium wilt resistance in a backcross inbred line population of cotton (*Gossypium hirsutum* × *Gossypium barbadense*) based on RGA-AFLP analysis. *Euphytica*. 194 (1): 79-91.

15. Zhang, J.F.*, **H. Fang***, H.P. Zhou, and S. Sanogo. 2013. Genetics, breeding, and marker-assisted selection for Verticillium wilt resistance in cotton. *Crop Science*. 54(4): 1289-1303 (* Equal contribution).

16. Zhou, H., **H. Fang**, S. Sanogo, S.E. Hughs, D.C. Jones, and J. Zhang. 2013. Evaluation of Verticillium wilt resistance in commercial cultivars and advanced breeding lines of cotton. *Euphytica*. 196 (3):437-448.

17. Zhang, J.F., **H. Fang**, H.P. Zhou, S.E. Hughs and D.C. Jones. 2013. Inheritance and transfer of thrips resistance from Pima cotton to Upland cotton. *Journal of Cotton Science*. 17 (2): 163-169.

18. Revilla-Molina, I.M, L. Bastiaans, H. Van Keulen, M.J. Kropff, **F. Hui**, N.P. Castilla, T. W. Mew, Y. Y. Zhu, H. Leung. 2009. Does resource complementarity or prevention of lodging contribute to the increased productivity of rice varietal mixtures in Yunnan, China? *Field Crops Research*. 111(3): 303-307.

19. Zhu, Y. Y., **H. Fang**, Y. Y. Wang, J. X. Fan, S. S. Yang, T. W. Mew, C. C Mundt. 2005. Panicle blast and canopy moisture in rice cultivar mixtures. *Phytopathology*. 95(4):433-438.

• **Publications in Chinese journals and books**

1. **Fang, H.,** J.H. Zhou, Y.Y. Wang, H.P Zhou, X.H. He, Y. Sun, L.H. Yang, and Y.Y. Zhu. 2007. Optimizing cultivation patterns for rice blast control. *Scientia Agricultura Sinica*. 40 (5): 916-924.

2. **Fang, H.,** P.N. Damodaran, and M. Cao. 2007. A preliminary study on arbuscular mycorrhizae of 4 species of the family Fagaceae in tropical secondary forest of Xishuangbanna*. Chinese Journal of Ecology*. 26 (9):1393-1396.

3. **Fang, H.,** P.N. Damodaran, M. Cao. 2007. A preliminary study of arbuscular mycorrhizal diversity in the subtropical secondary forest of Ailao Mountains, SW China*. Journal of Yunnan Agricultural University.* 22(6): 802-807.

4. **Fang, H.,** P.N. Damodaran, and M. Cao. 2006. Arbuscular mycorrhizal status of glomus plants in tropical secondary forest of Xishuangbanna, Southwest China. *Acta Ecologica Sinica*. 26 (12): 308-315.

5. **Fang, H.,** H.P. Zhou. Trans. Margolis. M. 2006. Crisis in the cupboard: Big threats to the world's crops. *Ecological Economy*. 9 (30): 18-23.

6. **Fang, H.,** and M. Cao. 2009. Assessment of heavy metals pollution by abandoned lead-zinc mine tailings in Huize, Yunnan. *Chinese Journal of Ecology*. 28 (7): 1277-1283.
7. He, H.M., **H. Fang,** H.P. Zhou, Y. Xie, L. Liu, J.M. Feng, C.Y. Li, and Y.Y. Zhu. 2010. Grey comprehensive evaluation on inter-planting systems of genetic diversity controlling rice blast diseases. *Southwest China Journal of Agricultural Sciences*. 23 (3): 724-727.
8. Chen, M., **H. Fang,** and M. Cao. 2008. Sprouting characteristics of sprouted woody plants in the mid-mountain humid evergreen broad-leaved forest on Ailao Mountain, Yunnan. *Guihaia*. 28 (5): 627-633.
9. Cao, Q., **H. Fang,** Y.C. He, Y.Y. Zhu. 2004. The influencing factors of *Pyricularia oryzae* (Cavara) spore distribution and spore trapping methods in fields. *Journal of Xinyang Agricultural College*. 14 (9):7-9.
10. Zhu, Y.Y., **H. Fang**, Y.Y. Wang, J.X. Fang, S.S. Yang, T.W. Mew, L. He, and C.C. Mundt. 2004. Relative humidity and rice surface area with dewdrop for rice blast control in variety mixture field. In Zhu, Y.Y. ed. *Biodiversity for Sustainable Crop Diseases Management: Theory and Technology.* Yunnan Science and Technology Press. Kunming, p148-156.
11. **Fang, H.,** Y.Y. Zhu, Y.Y. Wang, H.P. Zhou, L.H. Yang, Q. Cao, and Z.S. Mao. 2004. Optimization colony cultivation pattern of using genetic diversity for rice blast control. In Zhu, Y.Y. ed. *Biodiversity for Sustainable Crop Diseases Management: Theory and Technology*. Yunnan Science and Technology Press. Kunming, p513-519.
12. Yang, L.H., **H. Fang,** Y.Y. Wang, J.Q. Lan, Y. Sun, Q. Cao, C.C. Mundt, and Y.Y. Zhu. 2004. Rice variety diversity and plant silica content. In Zhu, Y.Y. ed. *Biodiversity for Sustainable Crop Diseases Management: Theory and Technology*. Yunnan Science and Technology Press. Kunming, p175-183.
13. **Fang, H.**, H.P. Zhou. 2003. The integrated pest management in sustainable agriculture. *Economy of the Source of the Pearl River*. 1:47-48.

• Publications in proceedings

1. **Fang, H.,** H.P. Zhou, S. Sanogo, R.P. Flynn, M. Gore, S.E. Hughs, D.C. Jones, and J.F. Zhang. 2013. Development of sequence tagged site (STS) markers for Verticillium wilt resistance in cotton based on RGA-AFLP analysis. Proc. Beltwide Cotton Conf., p.193-198. San Antonio, Jan. 7-10, 2013. Texas. National Cotton Council.
2. Zhou, H.P., **H. Fang,** S. Sanogo, R.P. Flynn, M. Gore, and J.F. Zhang. 2013. Segregation analysis of Verticillium wilt resistance in fourteen *Gossypium hirsutum* × *Gossypium barbadense* hybrids. Proc. Beltwide Cotton Conf., p.189-192. San Antonio, Texas, Jan. 7-10, 2013. National Cotton Council.
3. Zhang, J.F., **H. Fang,** H.P. Zhou, S.E. Hughs, and D.C. Jones. 2013. Thrips resistance in cotton: germplasm evaluation, inheritance and QTL mapping. Proc. Beltwide Cotton Conf., p.172-178. San Antonio, Texas, Jan. 7-10, 2013. National Cotton Council.
4. **Fang, H.,** H.P. Zhou, S. Sanogo, M. Gore, R.P. Flynn, R.G. Percy, D. Fang, and J.F. Zhang. 2012. Mapping quantitative trait loci (QTL) for resistance to Verticillium wilt (*Verticillium dahliae*) using a recombinant inbred line population (abstract). Proc. Beltwide Cotton Conf. p.785. Orlando, Florida, Jan. 3-6, 2012. National Cotton Council.
5. Zhou, H.P., **H. Fang,** S. Sanogo, R.P. Flynn, M. Gore, and J.F. Zhang. 2012. Resistance assessment of commercial cotton cultivars against *Verticillium dahliae* in Cotton. Proc. Beltwide Cotton Conf. p.731-735. Orlando, Florida, Jan. 3-6, 2012. National Cotton Council.

• Presentations & posters

1. Nicholas C. Manoukis, Barney P. Caton, **Hui Fang**, and Godshen R. Pallipparambil. New developments and applications of TrapGrid, a computer model for quantifying capture probability in a trap network. Entomological Society of America (ESA) Pacific Branch Meeting (Virtual), April 10 – 13, 2002, Santa Rosa, California.
2. **Hui Fang**, Kevin Bigsby, Barney Caton, Nicholas Manoukis, and Godshen Pallipparambil. Designing delimitation surveys for new pest introductions. The 10th International IPM

Symposium—Implementing IPM across Borders and Disciplines. Feb. 28 – March 3, 2022, Denver, Colorado.
3. **Fang, H.**, G.R. Pallippambil, N.C. Manoukis, B.C. Caton. Simulation-based design principles for delimiting trapping surveys for insect pests. 2021 NAISMA (North American Invasive Species Management (Poster). Association) Annual Conference—Invasive Species Management. Sept. 27 – 30, 2021, Missoula, Montana.
4. Caton, B.C., G.R. Pallippambil, N.C. Manoukis, **H. Fang**. An Improved Delimiting Trapping Survey Design for Insect Pests. 2021 NAISMA (North American Invasive Species Management Association) Annual Conference—Invasive Species Management. Sept. 27 – 30, 2021, Missoula, Montana.
5. **Fang, H.**, G.R. Pallippambil, N.C. Manoukis, B.C. Caton. Optimizing delimitation survey grids for insect pests. 2019 Annual Meeting of the International Pest Risk Research Group—Globalization and pest invasions: emerging risks and vulnerabilities. Sept. 3-6. 2019, Poznań, Poland.
6. Andres, R., V. Coneva, M. H. Frank, R. Tuttle, S.W. Han, L. F. S. Lopez, B. Kaur, L.L. Zhu, **H. Fang**, D. Bowman, M. Rojas-Pierce, C. Haigler, D. Jones, J. B. Holland, D. H. Chitwood, V. Kuraparthy. Modifications to a *LATE MERISTEM IDENTITY-1* gene are responsible for the major leaf shapes of Upland cotton (*Gossypium hirsutum* L.). Conference of American Society of Agronomy, Crop Science Society of America, and Soil Science Society of America. Nov. 07. 2016, Phoenix, AZ (Poster).
7. Andres, R., B. Kaur, R. Tuttle, L.L. Zhu, **H. Fang**, P. Tyagi, C. Haigler, D. Bowman, D. Jones, V. Kuraparthy. Fine Mapping and Cloning of the Major Leaf Shape Gene (*L-D1*) in Upland Cotton (*Gossypium hirsutum* L.) Presented by Andres, R. at the Bayer CropScience Research Symposium. Nov. 2015, Research Triangle Park, NC (Poster).
8. Kaur, B., L.L. Zhu, **H. Fang**, V. Kuraparthy. 2017. Germplasm Screening and Dissecting Growth Components Contributing to Thrips Tolerance in Cotton. Beltwide Cotton Conferences. Dallas, Texas Jan. 4 – 6, 2017.
9. **Fang, H.,** H.P. Zhou, S. Sanogo, R.P. Flynn, M. Gore, S.E. Hughs, D.C. Jones, and J.F. Zhang. 2013. Development of sequence tagged site (STS) markers for Verticillium wilt resistance in cotton based on RGA-AFLP analysis. Beltwide Cotton Conferences. San Antonio, Texas (Poster).
10. Zhou, H.P., **H. Fang,** S. Sanogo, R.P. Flynn, M. Gore, and J.F. Zhang. 2013. Segregation analysis of Verticillium wilt resistance in fourteen *Gossypium hirsutum* × *Gossypium barbadense* hybrids. Beltwide Cotton Conferences. San Antonio, Texas (Poster).
11. Zhang, J.F., **H. Fang,** H.P. Zhou, S.E. Hughs, and D.C. Jones. 2013. Thrips resistance in cotton: germplasm evaluation, inheritance and QTL mapping. Beltwide Cotton Conferences. San Antonio, Texas (Poster).
12. **Fang, H.,** H.P. Zhou, S. Sanogo, M. Gore, R.P. Flynn, R.G. Percy, D. Fang, and J.F. Zhang. 2012. Mapping quantitative trait loci (QTL) for resistance to Verticillium wilt (*Verticillium dahliae*) using a recombinant inbred line population. Beltwide Cotton Conferences. Orlando, Florida.
13. Zhou, H.P., **H. Fang,** S. Sanogo, R.P. Flynn, M. Gore, and J.F. Zhang. 2012. Resistance assessment of commercial cotton cultivars against *Verticillium dahliae* in Cotton. Beltwide Cotton Conferences. Orlando, Florida (Poster).

Outreach Activities
1. North American Invasive Species Management Association (NAISMA). North American Invasive Species Awareness Week. Feb. 22-28, 2021. Virtually held online by NAISMA.
2. The 10th Meeting of the Tephritid Workers from the Western Hemisphere, virtually held from Bogotá D.C., Colombia, Nov. 2-6, 2020.
3. 2019 Annual Meeting of the International Pest Risk Research Group—Globalization and pest invasions: emerging risks and vulnerabilities. Sept. 3-6. 2019, Poznań, Poland.

4. 2018 NC State University Plant Breeding Club Symposium: Next Generation Plant Breeder's Toolbox. Feb. 8, 2018, Raleigh, NC.
5. 2016 National Association of Plant Breeders (NAPB) meeting, Aug.15-18, 2016, Raleigh, NC.

Planted cotton field trials to demonstrate for attendees of their field trip for the NAPB meeting
6. 2015 Cotton Breeder's Tour, Cary, NC, Sept. 2015.

Planted cotton field trails for demonstration to the conference attendees
7. North Carolina Teachers' field trip, July 21, 2015

Planted cotton field trials to demonstrate cotton breeding program to teachers came for NC
8. Workshop in Field-based High Throughput Phenotyping, Maricopa, AZ, April 2014.
9. 2012 Beltwide cotton conference, Orlando, FL, Jan. 2012.
10. Science Fairs and Careers Days at various K-12 schools, Las Cruces, NM (Judge)
11. International Workshop on Sustainable Development and Biodiversity Conservation: Consequences of Land-Use Policy, July 2005, Menglun, China (Coordinator)
12. International Workshop on Tropical Land-use Changes and Ecological Consequences, Aug. 2006, Menglun, China (Coordinator)
13. Workshop on Canopy Training Programme for the ASEAN Region at Kota Kinabalu, Sabah, Malaysia, Sept. 2005

Dr Weiqi Luo
2001 South Rock Road, Fort Pierce, FL 34945
Office: 772-462-5884 Cell: 772-924-4127
Weiqi.Luo@ars.usda.gov

Summary

With a B.Sc. in Mathematics and Applied Mathematics from the University of Shantou, China (2003), a M.Sc. in Data Analysis, Network and Nonlinear Dynamical System from the University of York, UK (2004), and a Ph.D. in Statistics from the University of Leeds, UK (2008), Dr. Luo has gained extensive knowledge& experience in applied mathematics and statistics, computer simulations & forecasting, dynamic system and high-dimensional data analysis, to study disease dispersal and mitigation on a multinational scale. He has worked several years as biostatistician at The Food and Environmental Research Agency (UK) before beginning research in Florida (2011) as collaborated senior research scholar in NCSU and visiting scientist in USDA, Fort Pierce. He played a key role in a wide range of multidisciplinary projects including, but not limited to, risk-based survey of HLB/ACP in FL, CA, TX and AZ, Plum Pox Virus (PPV) survey in NY and CA, Census travel modelling, agent-based disease simulation, GIS disease mapping and Aerial image processing. He is actively involved in the production of research papers and conference presentations, ensuring prompt communication of findings to a wide scientific and academic community. To this end, he has contributed to a number of publications (45 peer reviewed papers) and has given numbers of external presentations (48 Published conference Proceedings/abstracts) on various aspects of his modeling work. He has developed interactive front-end interfaces to share models, tools and other project outputs to general audiences in a user-friendly manner (https://agriskmodels.com). He is also a frequent reviewer for the Journal of Phytopathology, Journal of Plant Pathology, and the Journal of Horticultural Science and Biotechnology.

Major research activities (lead PI/Co-PI)

1. *Risk-based models analyzing invasive and exotic pests/diseases of plants(primary focus), animals and humans*

Combining risk variables with geographic information system (GIS) data, we designed surveys and maps for stakeholders, helping facilitate the appropriation of fiscal and human resources for careful and cost-effective sampling.

a. Citrus huanglongbing (HLB) and its vector, Asian citrus psyllid (ACP) risk-based models and surveys (statewide and high-intensive local) – CA, FL, TX, AZ
b. Plum pox virus (PPV) risk-based models and surveys – NY, CA
c. Statewide Multipest Survey – FL (multiple pests and specific for Citrus Black Spot (CBS))

2. *Citrus Health Management Area (CHMA) construction and ACP monitoring – CA, FL*

Optimized the placement of CHMA boundaries according to similarity in disease intensity and pest populations, grouping regions with similar situations together for pragmatic evaluation and treatment.

3. *Spatially-explicit epidemiological models with early detection techniques (EDTs) and other control interventions*

Demonstrated how to optimize plant disease intervention and management with simulations of plant pathogen spatial distribution. HLB/ACP models emphasizing:

a. Mixed landscapes of residential/commercial citrus (Agent-based model)
b. Optimizing survey design strategy with manpower and resource constraints (Survey Extension)
c. Long distance disease dispersal with extreme climate events (Hurricane mediated spread)

4. *Census travel model for disease/pest introduction, with extensions to local transmission risk models*

Developed web application to model the effect of international travel on disease epidemics to predict the most likely locations for pest/disease introduction. Employing a geospatial method, the model integrates both U.S. census and international travel data with the epidemiological characteristics of various pathosystems to show which regions are most at-risk to disease introduction. Epidemiological models are then coupled with the census travel model to further identify areas at-risk of local reproduction and dispersal, as well as how diseases interact with the landscape of agricultural and residential areas

a. Census travel model for disease introduction
b. Human mediated dispersal for local disease transmission

5. Utilization of GIS data to investigate host and disease interaction

a. Aerial image analysis of citrus canopy in Florida to identify HLB impact
b. Investigate effect of neighboring crops/landscape on disease risk (Biodiversity)

Online App development and maintenance:

Agriculture Risk models home page (https://agriskmodels.com/)
Census travel risk introduction model (https://epi-models.shinyapps.io/CTUI/)
ACP/HLB dynamics in real-world landscapes (https://epi-models.shinyapps.io/ABM_Demo/)
Risk-based survey resource allocation (https://epi-models.shinyapps.io/SurveyExtension/)
ASTA Phyto-risk assessment for seed qualify management (https://epi-models.shinyapps.io/PhytoRisk/)
Predicting long-distance disease dispersal risk from major hurricane (https://epi-models.shinyapps.io/Hurricane/)
Human movement disease transmission and Hurricane long-distance disease dispersal front-end (under-development)
CCTEA Field survey design assistance tool (under-development)

Work Experience

2020-Present North Carolina State University, Raleigh, NC – Senior Research Scholar

- Provide leadership for a team focused on quantitative research on plant/pests using advanced decision support and modeling capabilities
- Lead the writing of grant proposals, peer reviewed papers, and managing of projects
- Work with collaborators and stakeholders to identify project needs
- Provide critical technical knowledge on modeling, statistics and computer programming
- Supervise students, technical staffs and researchers

2016-2019 North Carolina State University, Raleigh, NC – Research Scholar

- Lead/Co-lead multiple risk-based disease survey and management programs
- Predict pest/pathogen/disease introduction and progression through advance mathematical framework, spatiotemporal modeling and simulations
- Develop novel modeling tools with web Applications for disease management

2012-2015 North Carolina State University, Raleigh, NC – Postdoctoral Researcher

- Designed 1st risk-based HLB/ACP survey for residential citrus in CA, TX and AZ, and optimize available manpower for survey coverage and accuracy (published in 2013).
- Constructed the inventory for HLB/ACP disease and built-up the prediction model in FL, provided quarterly report for USDA APHIS disease control performance.

- Developed epidemiological model from census travel analysis (i.e. estimate foreign born and travel based on population changes)
- Established and managed internal database (1+ TB) for Subtropical Plant Pathology team in USDA, including US and International population census, American Community Survey, Global National Climate database (1921-present), enable science support for various researchers & projects.
- Responsible for PPV (Plum Pox Virus) commercial sampling designed in New York State (published in 2013).
- Enhanced the GI capability of USDA and provided technical advice in statistics and GIS, developing links with different experts in University, government and research institutes.

2009-2011 Food and Environment Research Agency (Fera), York – Statistician

- Provided professional statistical advice and analysis service to the team and more widely across the programme.
- Developed and applied modelling approaches that allow assessment of impacts of climate change, climatic variability and extreme weather events on plant disease, land use and the sustainability of crop production.
- Provided early warning of disease risk with uncertainty in order to optimise spray application.
- Developed methods for monitoring and predicting invasive disease movements at appropriate spatial scales incorporating responses to the environment and climate factors, successfully launched on CropMonitor website.
- Developed innovative methods and refined tools (in C++) for risk mapping with uncertainty analysis for the Defra Phytyophthora modelling project

2006-2008 PhD Placement in Central Science Laboratory, York – Quantitative research analyst

- Managing the research project at all stages and working within a team of multidisciplinary experts; ensured milestones were met and key data achieved.
- Update and maintain long term UK weather data (5,000,000+) records and provide corresponding modelling supports.
- Identify and construct innovative statistical methods for disease forecasting.
- Undertook data analysis and modelling, successfully related theory to practical applications.
- Produced reports and technical papers and delivered presentations to various technical experts.

2005-2006 Central Science Laboratory, York – Research assistant (voluntary)

- Designed and implemented digital leaf assessment, image acquisition and analysis.
- Volunteered to develop an image analysis programme (in R) to quantify disease symptoms automatically while continuing work responsibilities.

Summer 2004 MSc Placement in Central Science Laboratory, York – GIS Analyst

- Participated in data collection and ensured accuracy, quality and reliability.
- Development of spatial interpolation methodology for different weather variables.

Spring 2003 NanSha information technology department, GuangZhou, China – Data analyst

- Gained experience of data collection and comprehension of the need for accuracy and availability of the relevant data.

- Provide data analysis, distribution fitting, regression analysis and other simulation modelling supports

2001- 2002 Shantou University, China – Class Advisor for 'Freshers' (voluntary)

- Provided advice and support to Freshers and assisted the class tutor in coping with students' problems/concerns.

Education and Qualifications

2005-2008 PhD in Statistics (ORSAS award and Enterprise scholarship)
University of Leeds, England

Thesis title: "Predicting annual and regional fluctuations in crop health – development and application of new approaches".

- Spatial interpolation of the prevalence and severity of wheat disease.
- Develop novel methods, such as high dimensional regression, to account for the main factors influencing the magnitude of epidemics.
- Provide quantitative estimates of seasonal and regional disease pressures via the CropMonitor project.

2003-2004 MSc in Data Analysis, Network and Nonlinear Dynamical System (Distinction)
University of York, England

2000-2003 Diploma in Computer Science, University of Shantou, China

1999-2003 BSc in Mathematics and Applied Mathematics (First Class), University of Shantou, China

Key Skills and Knowledge

Technical

- A high level of proficiency in a range of statistical methods including: Regression analysis, Multivariate analysis, Time series analysis, Spatial analysis, Survival analysis, Wavelet analysis, Sensitivity and Uncertainty analysis, Experimental design, Bayesian statistics, Mathematical simulation.
- Proficient user of statistical computing packages including R, SPSS, SAS and the high level programming language Matlab.
- Familiar with programming in C/C++ to provide numerical solutions for business or mathematical problems.
- Outstanding modelling skills in a science, policy or business environment.
- Firm knowledge of SQL to for large dataset manipulation.
- Solid working experiences in ARCGIS & Google Earth, utilising current tools and technologies for spatial data analysis, interpolation, geostatistics, landscape change detection, monitoring, modelling and management.
- Good office skills: ability to manage data records and file documents; also proficient in many Microsoft Office packages i.e. Word, Excel, PowerPoint, Access and Outlook.
- Extensive experience in LaTeX for producing high quality documents in PDF format.
- Ability for innovative graphic design with practical experience in GIMP, Photoshop, Inkscape and VedioStudio.
- Practical experience in web-based application development using R Shiny package

General

- Research and leader - Played a key/leading role in a wide range of multidisciplinary projects including, but not limited to; Risk-based disease survey design for commercial and residential citrus in CA, TX and AZ; International census travel for disease introduction; HLB/ACP control performance modelling in FL; Compliance study from human behavior; live disease forecasting in crop monitor; quarantine measures for infectious disease; estimation

of crop health risk (*Fusarium* toxin); automatic disease assessment (using digital image analysis); bracken toxin mapping; Rural Economy and Land Use (RELU) modelling

- Problem Solving – using statistics to achieve scientific result across a broad range of agricultural investigations with track record of innovative application of new statistical methods and statistical computing expertise.
- Project Management – apply effective management skills through the setting of research goals, intermediate milestones and prioritisation of activities.
- Ability to work independently and in teams – manage own time and priorities to ensure delivery of tasks within tight time and resource constraints; develop and maintain positive relationships with colleagues, based on mutual understanding and respect, and the ability to motivate and support others within the team.
- Communication Skills – ability to communicate sophisticated technical ideas to a variety of audiences; demonstrated oral and written communication skills in various work experience and in publication of research work in peer reviewed journals.

Best Speaker Award 2008: Annual Student Seminar, Central Science Laboratory, York.
2nd Prize Award 2007: Annual Student Poster Competition, Central Science Laboratory, York.
Mentoring and teaching statistics to two high school students during their summer internship

- Personal Drive – high self-discipline and motivation. Established contacts and productive information flows with research institutions and other personnel to ensure knowledge and awareness of advance modelling techniques and emerging issues and trends.
- Language Skills – Cantonese and Mandarin: native; English: fluent. Have acted as language interpreter for past Fera Chief Executive [Prof. Mike Roberts] for visiting Chinese government delegation.
- Full, clean US, UK & China driving licence.

Interests and Activities

An avid sports fan, I play badminton, Pingpong, Tennis, basketball, golf and enjoy watching many other sports. In Florida and England, I have come to enjoy cooking for friends and introducing non-Chinese friends to the esoteric mysteries of Chinese cuisine. Cultural exchange has been good for me and I have established good friendships with Western nationals and have enjoyed spending time with them in situ opening myself up to a very different cultural lifestyle. Other favorite pastimes include golfing, swimming, travelling and reading.
Full details of my professional output are in the attached appendix to this CV.

Professional membership

- Manuscript academic editors for Peer J (2016-present)
- Manuscript reviewer for Crop protection (2015-present)
- Manuscript reviewer for Canadian Journal of Plant Pathology (2015-Present)
- Manuscript reviewer for the Journal of Plant pathology (2015-present)
- Manuscript reviewer for the Phytopathology (2011-present)
- Manuscript reviewer for the Journal of Horticultural Science and Biotechnology (2012-present)
- Manuscript reviewer for the Renewable & Sustainable Energy Reviews (2015-present)
- Proposal reviewer for Bill and Melinda Gates Foundation (2015-present)
- Member of American Phytopathological Society (2012-present)
- Member of the Royal Statistical Society (2005-2012)
- Member of British Society for Plant Pathology (2008-2011)

Scientific Publications for Dr Weiqi Luo

Manuscripts published

1. Armstrong, C.M., Zhou, L., **Luo, W**., Batuman, O., Alabi, O.J., & Duan, P. (2021) Identification of a chromosomal deletion mutation and the dynamics of two major populations of Candidatus Liberibacter asiaticus in its hosts. *Phytopathology*, 112:81-88, https://doi.org/10.1094/PHYTO-08-21-0325-FI.
2. Armstrong, C.M. Doud, M.S., Latza, C.L., **Luo, W**., Zhao, W., Plotto, A., Bai, J., Stover, E. & Duan, P. (2021) Beneficial horticultural traits derived from the application of solar thermotherapy to mature HLB-affected citrus trees. Horticultural Plant Journal, https://doi.org/10.1016/j.hpj.2021.04.008
3. Qian, M., Wang, L., Zhang, S., Sun, L., **Luo, W.**, Posny, D., Xu, S., Tang, C., Ma, M., Zhang, C., Lin, S., Wang, J., Hui, W., Zhang, S. 2021. Investigation of proline in superficial scald development during low temperature storage of 'Dangshansuli' pear fruit. Postharvest Biology and Technology, 181,111643. https://doi.org/10.1016/j.postharvbio.2021.111643.
4. Wang, L., Ma, M., Zhang, S., Wu, Z., Li, J., **Luo, W.,** Guo, L., Lin, W., Zhang, S. 2021. Characterization of genes involved in pear ascorbic acid metabolism and their response to bagging treatment during 'Yali' fruit development. Scientia Horticulturae, 285, 110178.https://doi.org/10.1016/j.scienta.2021.110178.
5. Zhang, S., Zhang, Z., Sun, X., Liu, Z., Ma, M., Fan, J., **Luo, W**., Wang, L. & Zhang, S. (2021) Identification and characterization of invertase family genes reveal their roles in vacuolar sucrose metabolism during Pyrus bretschneideri Rehd. fruit development. Genomics, 113, 1887-1097.
6. Gottwald, T.R., Taylor, E.L., Amorim, L., Bergamin-Filho, A., Bassanezi, R.B., Silva, G.J., Fogliata, G., Fourie, P.H., Graham, J.H., Hattingh, V., Kriss, A.B., **Luo, W**., Magarey, R.D., Schutte, G.C. & Spósito, M.B. (2021) Probabilistic risk-based model for the assessment of Phyllosticta citricarpa-infected citrus fruit and illicit plant material as pathways for pathogen introduction and establishment. Crop Protection, 142. https://doi.org/10.1016/j.cropro.2020.105521.
7. Gottwald T, Poole G, Taylor E, **Luo W**, Posny D, Adkins S, Schneider W, McRoberts N. Canine Olfactory Detection of a Non-Systemic Phytobacterial Citrus Pathogen of International Quarantine Significance. Entropy. 2020; 22(11):1269. https://doi.org/10.3390/e22111269
8. **Luo, W.,** Posny, D., Kriss, A.B., Graham, J.H., Poole, G.H., Taylor, E.L., McCollum, G., Gottwald, T.R., Bock, C.H. (2020) Seasonal and post-harvest population dynamics of the Asiatic citrus canker pathogen *Xanthomonas axonopodis pv. citri* on grapefruit in Florida, Crop Protection, https://doi.org/10.1016/j.cropro.2020.105227
9. Gottwald T, Poole G, McCollum T, Hall D, Hartung J, Bai J, **Luo W**, Posny D, Duan Y-P, Taylor E, da Graça J, Polek M, Louws F, Schneider W (2020) Canine olfactory detection of a vectored phytobacterial pathogen, Liberibacter asiaticus, and integration with disease control. Proceeding of the National Academy of Sciences of the United States of America 117:3492–3501
10. Hilf, M.E. **Luo W**. (2019) Vacuum-Assisted Infiltration of Citrus Leaves to Identify Antimicrobial Compounds Effective against '*Candidatus* Liberibacter asiaticus'. Plant Disease, 104: 1894-1899.
11. Colmar, S., McKenzie, C.L., **Luo, W.**, Osborne, L.S. (2020) First report of Bemisia tabaci Mediterranean (biotype Q) (Hemiptera: Aleyrodidae) in the Dominican Republic. Florida Entomol 102(4): 778-782.
12. Zhang, S., Ma, M., Zhang, H., Zhang, S., Qian, M., Zhang, Z., **Luo, W**., Fan, J., Liu, Z. & Wang, L. 2019. Genome-wide analysis of polygalacturonase gene family from pear genome and identification of the member involved in pear softening. BMC Plant Biol 19, 587 doi:10.1186/s12870-019-2168-1
13. Gottwald, T., **Luo, W**., Posny, D., Riley, T., Louws, F. (2019) A probabilistic census travel model to predict introduction sites of exotic plant, animal and human pathogens. Phil. Trans. R. Soc. B 20180260. http://dx.doi.org/10.1098/rstb.2018.0260

14. McRoberts, N., Figuera, S.G., Olkowski, S., McGuire, B., **Luo, W**., Posny, D., & Gottwald, T. (2019) Using models to provide rapid programme support for California's efforts to suppress Huanglongbing disease of citrus. Phil. Trans. R. Soc. B 20180281. http://dx.doi.org/10.1098/rstb.2018.0281
15. Gottwald, T., **Luo, W.** and McRoberts, N. (2019) Risk-based HLB survey for California – optimizing delimiting survey distance. Citrograph, 10, 30-32.
16. Wang, L., Baldwin, E., **Luo, W.**, Zhao, W., Brecht, J., Bai, J. (2019), Key tomato volatile compounds during postharvest ripening in response to chilling and pre-chilling heat treatments. Postharvest biology and technology, 154, 11-20.
17. Wang, L., **Luo, W.**, Sun, X., Qian, C. (2018) Changes in flavor-relevant compounds during vine ripening of tomato fruit and their relationship with ethylene production. Hortic. Environ. Biotechnol. 59, 787–804. https://doi.org/10.1007/s13580-018-0067-2
18. Wang, L, Ma, M., Zhang, Y., Wu, Z., Guo, L., **Luo W.**, Zhang, Z, Wang L., Zhang, S. (2018), Characterization of the Genes Involved in Malic Acid Metabolism from Pear Fruit and Their Expression Profile after Postharvest 1-MCP/Ethrel Treatment. Journal of Agricultural and Food Chemistry, DOI: 10.1021/acs.jafc.8b02598
19. Wang, L., Sun, X., **Luo, W**., & Qian, C. (2018). Roles of C-repeat binding factors-dependent signaling pathway in jasmonates-mediated improvement of chilling tolerance of postharvest horticultural commodities. Journal of Food Quality, DOI: 10.1155/2018/8517018
20. Ding F., Allen, V., **Luo, W**., Zhang, S., Duan, Y.P. 2018. Molecular mechanisms underlying heat or tetracycline treatments for citrus HLB control. Horticulture Research volume 5, Article number: 30
21. Hilf, M.E. **Luo W**. 2018. Dynamics of 'Candidatus Liberibacter asiaticus' Colonization of New Growth of Citrus. Phytopathology, DOI: 10.1094/PHYTO-12-17-0408-R
22. Gottwald, T., **Luo, W**. and McRoberts, N. 2018. Risk-based HLB surveys for California – an analysis of the increasing risk of HLB over the last five years. Citrograph, 9, 38-42
23. Wang, L., Qian, C., Bai, J., **Luo, W**., Jin, C. & Yu, Z. (2017) Difference in volatile composition between the pericarp tissue and inner tissue of tomato (*Solanum lycopersicum*) fruit. *Journal of Food Processing and Preservation*, 2017;e13387. DOI: 10.1111/jfpp.13387.
24. Doud, M.M., Wang, YS, Hoffman MT, Latza CL, **Luo W**, Armstrong CM, Gottwald TR, Dai LD, Luo F & Duan YP. (2017) Solar thermotherapy reduces the titer of *Candidatus Liberibacter asiaticus* and enhances canopy growth by altering gene expression profiles in HLB-affected citrus plants. *Horticulture Research* 4, 17054; doi:10.1038/hortres.2017.54
25. McCollum, G., Hilf, M., Irey, M., **Luo, W.** & Gottwald, T. (2016) Susceptibility of sixteen citrus genotypes to '*Candidatus Liberibacter asiaticus'***.**, *Plant Disease*. 100, 1080-1086.
26. Wang, L., Baldwin, E.A., Plotto, A., **Luo W.**, Raithore S, Yu Z. & Bai, J. (2015) Effect of methyl salicylate and methyl jasmonate pre-treatment on the volatile profile in tomato fruit subjected to chilling temperature, *Postharvest Biology and Technology*, 108, 28-38.
27. Gottwald, T. R., and **Luo, W**. (2014) The efficacy of Citrus Health Management Areas of Florida. *The newsletter of the Indian River Citrus League*, September, 9-11.
28. Gottwald, T. R., **Luo, W**., and McRoberts, N. (2014) Risk-Based Residential HLB/ACP Survey for California, Texas, and Arizona. *Citrograph Magazine*, Spring. 52-59.
29. Gottwald, T.R., Wierenga, E., **Luo, W**. & Parnell, S. (2013) Epidemiology of Plum Pox 'D' strain in Canada and the USA. *Canadian Journal of Plant Pathology*, **35**, 442-457.
30. Gottwald, T. R., **Luo, W**., and McRoberts, N. (2013) Risk-Based Residential HLB/ACP Survey for California, Texas, and Arizona. Plant Management Network (Webcast). **http://www.plantmanagementnetwork.org/edcenter/seminars/Outreach/Citrus/HLB/**
31. Cuthbertson, A.G.S., Mathers, J.J., Blackburn, L.F., Korycinska, A., **Luo, W**., Jacobson, R.J. & Northing, P. (2013) Population development of *Tuta absoluta* (Meyrick) (Lepidoptera: Gelechiidae) under simulated UK glasshouse conditions. *Insects*, **4**, 185-197.

32. Cuthbertson, A.G.S., Mathers, J.J., Croft, P., Nattriss, N., **Luo, W.**, Northing, P., Muari, T., Jacobson, R.J. & Walters, K.F.A. (2012). The potential of four mites from the family Phytoseiidae to form components of an IPM strategy for Thrips palmi Karny (*Thysanoptera: Thripidae*): Prey consumption rates and compatibility with pesticides of four predatory mites from the family Phytoseiidae attacking Thrips palmi Karny (*Thysanoptera: Thripidae)*. *Pest Management Science*, 68, 1289-1295.
33. **Luo, W.**, Pietravalle, S., Parnell, S., van den Bosch, F., Gottwald, T.R., Irey, M.S. & Parker S.R. (2012). An improved regulatory sampling method for mapping and representing plant disease from a limited number of samples. *Epidemics,* **4**, 68-77.
34. Parnell, S., Gottwald, T.R., Irey, M.S., **Luo, W.** & van den Bosch, F. (2011). A stochastic optimisation method to estimate the spatial distribution of an invasive plant pathogen. *Phytopathology*, **101,** 1184-1190.
35. Cuthbertson, A.G.S., Blackburn, L.F., Northing, P., **Luo, W.**, Cannon, R.J.C. & Walters, K.F.A. (2010). Chemical compatibility testing of the entomopathogenic fungus *Lecanicillium muscarium* to control *Bemisia tabaci* in glasshouse environment. *International Journal of Environmental Science and Technology*, **7**, 405-409.
36. Fordyce, F.M., Brereton, N., Hughes, J., **Luo W.** & Lewis, J. (2010). An initial study to assess the use of geological parent materials to predict the Se concentration in overlying soils and in five staple foodstuffs produced on them in Scotland. *Science of the Total Environment*, **408**, 5295-5305.
37. Cuthbertson, A.G.S., Blackburn, L.F., Northing, P., **Luo, W.**, Cannon, R.J.C. & Walters, K.F.A. (2009). Leaf dipping as an environmental screening measure to test chemical efficacy against *Bemisia tabaci* on poinsettia plants. *International Journal of Environmental Science and Technology*, **6**, 347-352.
38. Cuthbertson, A.G.S., Blackburn, L.F., Northing, P., Mathers, J.J., **Luo, W.** & Walters, K.F.A. (2009) Environmental evaluation of hot water treatments to control *Liriomyza huidobrensis* infesting plant material in transit. *International Journal of Environmental Science and Technology*, **6**, 167-174.
39. Cuthbertson, A.G.S., Mathers, J.J., Blackburn, L.F., Wakefield, M.E., Collins, L.E., **Luo, W.** & Brown, M.A. (2008). Maintaining *Aethina tumida* (Coleoptera: Nitidulidae) under quarantine laboratory conditions in the UK and preliminary observations on its behaviour. *Journal of Apicultural Research*, **47**, 192-193.
40. Cuthbertson, A.G.S., Blackburn, L.F., Northing, P., **Luo, W.**, Cannon, R.J.C. & Walters, K.F.A. (2008). Further compatibility tests of the entomopathogenic fungus *Lecanicillium muscarium* with conventional insecticide products for control of sweetpotato whitefly, *Bemisia tabaci* on poinsettia plants. *Insect Science*, **15**, 355-360.
41. **Luo, W.**, Baxter, P.D., & Taylor, C.C. (2008), Discussion of *Sure independence screening for ultra-high dimensional feature space* by Fan and Lv, *Journal of the Royal Statistical Society Series B*, **70**, 899-900.
42. **Luo, W.**, Taylor, M.C. & Parker, S.R. (2008). A comparison of spatial interpolation methods to estimate continuous wind speed surfaces using irregularly distributed data from England and Wales. *International Journal of Climatology,* **28**, 947-959.
43. Cuthbertson, A.G.S., Mathers, J.J., Northing, P., **Luo, W.** & Walters, K.F.A. (2007). The susceptibility of immature stages of Bemisia tabaci to infection by the entomopathogenic nematode *Steinernema carpocapsae*. *Russian Journal of Nematology*, **15**, 153-156.
44. Cuthbertson, A.G.S., Walters, K.F.A., Northing, P. & **Luo, W.** (2007). Efficacy of the entomopathogenic nematode, *Steinernema feltiae*, against sweetpotato whitefly, *Bemisia tabaci*, under laboratory and glasshouse conditions. *Bulletin of Entomological Research*, **97**, 9-14.
45. **Luo, W.** & Boatman, N. (2011) An investigation of crop choice through crop rotation. Aspects of Applied Biology, **113**, 53-60.

46. Cuthbertson, A.G.S., Mathers, J.J., Northing, P., **Luo, W.** & Walters, K.F.A. (2007). Establishing effect of commonly used insecticides for aphid control on the infectivity of the entomopathogenic nematode *Steinernema feltiae* using a streamlined screening method. *Journal of Environmental Research and Development*, **2**, 1-5.
47. Parker, S.R., McDonough, S., **Luo, W.**, Lamborne, C. & McPherson, G.M. (2006). Quantifying fungicide resistance in *Puccinia horiana*, the cause of chrysanthemum white rust. *Aspects of Applied Biology,* **78**, 45-50.
48. **Luo, W.** & Yang, S. (2004). The iterative method of solving algebraic equation and implementation on the computer. *Henan Science*, **22**, 18-22.

Drafted:
1. Luo W., Posny D., Gottwald T.R. and McRoberts N. (2019) Agent-based model to predict ACP/HLB spread dynamics in regional landscapes –Part I.
2. Posny D., Luo W., Gottwald T.R. and McRoberts N. (2019) Agent-based model to monitor the efficacy of adaptive ACP/HLB control programs with underlying social-economic behavioral influences – Part II.
3. Luo W., Posny D., Gottwald T.R. (2019) Retrospective analyses and prediction of local disease transmission with integration of international travel and US census data – a case study of Zika in Florida.

Published conference Proceedings/abstracts:

1. **Luo. W.,** & Posny, D. (2022) 'Landscape risk analysis for targeted pest management and surveillance', Pittsburgh, APS annual conference 08/2022.
2. **Luo. W.,** & Posny, D. (2022) 'Predicting the spread of plant pests following major weather events', Pittsburgh, APS annual conference 08/2022.
3. **Luo. W.,** & Posny, D. (2022) Modeling spread in different landscapes to inform management programs' Denver, Colorado, IPM symposium 03/2022.
4. Posny, D., & **Luo. W.** (2022) Predicting introductions of emerging pests and diseases and designing risk-based surveys' Denver, Colorado, IPM symposium 03/2022
5. **Luo. W.,** & Posny, D. (2021) Virtual workshop 'Multi Criteria Analysis - Risk mapping methodology for invasive pests', IICA Chile. October 2021.
6. **Luo. W.,** & Posny, D. (2021) Plant Pest Modeling and Risk Mapping' Raleigh, CIPM showcase. 09/2021.
7. **Luo. W.,** Posny, D., & McRoberts, N. (2021) Evaluation of risk-based model for residential citrus HLB survey in Southern CA. 2021 APS Annual Virtual Meeting. August 02-06, 2021.
8. **Luo. W**., Posny, D., McRoberts, N, & Gottwald, T. (2020) Using agent based simulation model to evaluate the impact of citrus landscape on ACP/HLB management. 2020 APS Annual Virtual Meeting. August 10-14, 2020
9. **Luo. W.,** Posny, D., & Gottwald, T. (2020) A case study of ACP/HLB dispersal into CA commercial citrus under different control protocols. CIPM Seminar plus, Raleigh 01/2020.
10. Duan, Y., Armstrong, C., Zhou, L., Allen, V., **Luo, W**. & Hall, D. (2019) Host-dependent chromosomal deletion mutations in the mosaic island of Candidatus Liberibacter asiaticus genome. Proceeding of the joint 2019 IOCV-IRCHLB conference, Riverside, CA, March 10-15. IRCHLB-O1a-06
11. Gottwald, T., Poole, G., McCollum, G., **Luo, W**., Posny, D., Bai, J. & Baldwin, E. (2019) Update on Canine assisted early detection of HLB. Proceeding of the joint 2019 IOCV-IRCHLB conference, Riverside, CA, March 10-15. IRCHLB-O3a-05

12. McCollum, G., Hall, D., & **Luo, W**. (2019) CLas titer in ACP, not infected citrus, is the driving force for the spread of HLB. Proceeding of the joint 2019 IOCV-IRCHLB conference, Riverside, CA, March 10-15. IRCHLB-O3a-03
13. Hajeri, S., Liao, W, Westerman, K., Barnier, J., **Luo, W**., Gottwald, T., & Yokomi, R. (2019) High-risk based field survey and high-throughput qPCR detection system for Huanglongbing-associated bacteria in commercial groves of California. Proceeding of the joint 2019 IOCV-IRCHLB conference, Riverside, CA, March 10-15. IRCHLB-P5-61
14. Posny D, **Luo W**., Taylor, E., Gottwald, T., & Louws, F. (2019) Analyzing the impact of sampling on PCR efficiency from field studies under HLB epidemic development in FL. Proceeding of the joint 2019 IOCV-IRCHLB conference, Riverside, CA, March 10-15. IRCHLB-P5-60
15. **Luo W**., Posny D, Gottwald, T., & Louws, F. (2019) Risk based HLB survey extension: optimizing delimitation radius for cost-effective disease control. Proceeding of the joint 2019 IOCV-IRCHLB conference, Riverside, CA, March 10-15. IRCHLB-P5-63
16. **Luo W**., Posny D, Zhang S, Gottwald, T., & Louws, F. (2019) Predict likelihood of ACP/HLB dispersal into CA commercial citrus under different control protocols, Proceeding of the joint 2019 IOCV-IRCHLB conference, Riverside, CA, March 10-15. IRCHLB-O3a-04
17. Gottwald, T. & **Luo, W**., (2018) Hurricane Irma: A Predictive Model Estimation of Citrus Black Spot Spread and Areas impacted. Florida Citrus Show, Jan 24-25, 2018, Fort Pierce, FL.
18. **Luo, W.** & Gottwald, T. (2018) Risk based ACP/HLB survey model for Argentina. Invited speaker. Apr 04-11, 2018, Concordia, Argentina.
19. **Luo, W** (2017) Analytical tool for Aphis PPQ, June 14, Raleigh, NC.
20. Posny D, **Luo W**, McRoberts N, and Gottwald TR (2017) Different Scenario-based simulations of ACP & HLB dynamics in central Valley, CA for consideration of disease management. Proceeding of 5th International Research Conference on HLB, Orlando, FL, USA. March 15-17, p34
21. **Luo W.**, Posny D, Zhang S, McRoberts N, and Gottwald TR (2017) Agent based model to predict/monitor the efficacy and cost of various ACP control strategies. Proceeding of 5th International Research Conference on HLB, Orlando, FL, USA. March 15-17, p26
22. **Luo W**., Gottwald, T.R., Riley T., and Louws, F. (2017) Florida CHMA performance and implications on citrus production and sampling design. Proceeding of 5th International Research Conference on HLB, Orlando, FL, USA. March 15-17, p26.
23. **Luo W**., Gottwald, T.R., and Posny D. (2017) Calculating historical citrus reduction rate/pattern using aerial photographic and GIS techniques. Proceeding of 5th International Research Conference on HLB, Orlando, FL, USA. March 15-17, p26.
24. **Luo W**., Gottwald, T.R., and Louws, F. (2017) CHMA design: performance review, concerns and a risk-based optimization for Treasure Coast areas in Florida. Proceeding of 5th International Research Conference on HLB, Orlando, FL, USA. March 15-17, p25-26.
25. Gottwald, T.R., Poole G., Taylor E, Hall, D, Hartung J, Bartels D, McCollum D, Hilf M, **Luo W**, and Louws, F. (2017) Use of HLB detection canines in real world settings. Proceeding of 5th International Research Conference on HLB, Orlando, FL, USA. March 15-17, p16.
26. Gottwald, T.R., Poole G., Taylor E, Hall, D, Hartung J, Bartels D, McCollum D, Hilf M, **Luo W**, and Louws, F. (2017) Canine assisted early detection of HLB. Proceeding of 5th International Research Conference on HLB, Orlando, FL, USA. March 15-17, p16.
27. Gottwald, T.R., **Luo W**., Riley T., and Louws, F. (2017) Census travel risk model to predict points of disease/pest introduction. Proceeding of 5th International Research Conference on HLB, Orlando, FL, USA. March 15-17, p15.
28. Gottwald, T.R and **Luo W**. (2017) Risk based HLB survey for Hacienda Heights and San Gabriel in Southern CA. Proceeding of 5th International Research Conference on HLB, Orlando, FL, USA. March 15-17, p15.

29. **Luo,** W. & Gottwald, T.R. (2016) Agent based model for simulation of Asian Citrus Psyllid spread across different landscapes. 2016 International Congress of Entomology, 25-30th September, Orlando, FL; doi: 10.1603/ICE.2016.93308
30. **Luo,** W. & Gottwald, T.R. (2016) Census travel risk model to predict points of disease/pest introduction. Emerging plant disease and global food security conference, Raleigh, NC, 22-25th March.
31. **Luo, W.** & Gottwald, T.R. (2015) A mathematical model for the dynamics of Asian Citrus Psyllid (ACP) spread in different landscapes. Proceeding of 2015 APS Annual Meeting, Pasadena, California, 1-5th August, 644-P.
32. **Luo, W.,** Gottwald, T.R. & McCollum, G. (2015) Improved residential citrus host mapping and its potential influence on Asian Citrus Psyllid (ACP) population. Proceeding of 2015 APS Annual Meeting, Pasadena, California, USA. 1-5th August, 52-O.
33. **Luo, W.** & Gottwald, T.R. (2015) CHMA design and construction for Central Valley in California. Proceeding of 4th International Research Conference on HLB, Orlando, FL, USA. 9-13rd February.
34. **Luo, W.** & Gottwald, T.R. (2015) Modeling ACP spread within mixed residential and commercial landscape. Proceeding of 4th International Research Conference on HLB, Orlando, FL, USA. 9-13rd February.
35. **Luo, W.,** Gottwald, T.R. & McCollum, G. (2015) Demographic and socioeconomic influences on citrus species preference: Influence on residential tree populations and potential influence on ACP population and HLB epidemics. Proceeding of 4th International Research Conference on HLB, Orlando, FL, USA. 9-13rd February.
36. **Luo, W.** & Gottwald, T.R. (2015) A census-travel predictive model for introduction sites of HLB to inform and optimize detection surveys. Proceeding of 4th International Research Conference on HLB, Orlando, FL, USA. 9-13rd February.
37. **Luo, W.,** Riley, T. & Gottwald, T.R. (2015) Assessment of Citrus Health Management Areas and their performance in Florida. Proceeding of 4th International Research Conference on HLB, Orlando, FL, USA. 9-13rd February
38. McCollum, G., Hilf, M., Irey, M., **Luo, W.**, Gottwald, T. & Hall, D. (2015) HLB on a small scale - what can we learn from a "model" system. Proceeding of 4th International Research Conference on HLB, Orlando, FL, USA. 9-13rd February.
39. Riley, T.D., **Luo, W.**, & Gottwald, T.R. (2014) Citrus health management areas and associated surveys in Florida. Proceeding of 2014 APS-CPS Joint Meeting, Minneapolis, Minnesota, USA. 8-13th August, 293-P.
40. **Luo, W.**, & Gottwald, T.R. (2014) Finding an optimal spatial scale for citrus health management in California. Proceeding of 2014 APS-CPS Joint Meeting, Minneapolis, Minnesota, USA. 8-13th August, 201-O.
41. **Luo, W**. (2014) Risk-based modelling for plant disease: Citrus Greening as a case study. NCUS plant pathology seminar, Raleigh, NC, USA. March 5, 2014.
42. Gottwald, T.R. **Luo, W**., & Parnell, S. (2013) Risk-based survey method for PPV detection and intervention in US stonefruit. 2nd International Symposium on Plum Pox Virus, Olomouc, Czech Republic, 3-6th September, 2013.
43. Gottwald, T.R., **Luo, W**., Riley, T. & Parnell, S. (2013) Commercial risk-based survey for HLB and implications for efficacy of Citrus Health Management Areas (CHMAs). Journal of Citrus pathology, 1, 110-111.
44. **Luo, W.,** Gottwald, T.R., Pietravalle, S. & Irey, M.S. (2013) Predicting the establishment and spread of plant disease from regulatory sampling. Journal of Citrus pathology, 1, 112-115.
45. Gottwald, T.R., **Luo, W**. & McRoberts, N. (2013) Risk-based residential HLB/ACP survey for California, Texas and Arizona. Journal of Citrus pathology, 1, 121-125.
46. **Luo, W**., Anco, D.J., Gottwald, T.R. & Irey, M.S. (2013) Edge effects and Huanglongbing. Journal of Citrus pathology, 1, 126-127.

47. **Luo, W**., Gottwald, T. & Irey, M.S. (2012). Assessment s of edge effect in intensity of HLB disease. Proceedings of 2012 APS Annual Meeting, Providence, Rhode Island, USA. 4-8th August 2012. 526-P.

48. Cuthbertson, A.G.S., Blackburn, L.F., Northing, P., **Luo, W.,** Cannon, R.J.C. & Walters, K.F.A. (2009). Further compatibility studies of *Lecanicillium muscarium* with insecticides for eradication of *Bemisia tabaci* in UK glasshouses. Proceedings of the 5th International *Bemisia* workshop, Guangzhou, P.R. China. 9-12th November 2009. pp. 45-46.

49. Cuthbertson, A.G.S., Blackburn, L.F., Northing, P., **Luo, W.,** Cannon, R.J.C. & Walters, K.F.A. (2009). Leaf dipping to test chemical efficacy against *Bemisia tabaci* on poinsettia plants. Proceedings of the 5th International *Bemisia* workshop, Guangzhou, P.R. China. 9-12th November 2009. pp. 91-92.

50. Cuthbertson, A.G.S., Mathers, J.J., Northing, P., **Luo, W.** & Walters, K.F.A. (2009). Efficacy of *Steinernema carpocapsae* against *Bemisia tabaci* instars. Proceedings of the Third International Symposium on Biological Control of Arthropods, Christchurch, New Zealand. 8-13th February 2009. Pp. 607.

51. Cuthbertson, A.G.S., Blackburn, L.F., Northing, P., **Luo, W.,** Cannon, R.J.C. & Walters, K.F.A. (2008). Compatibility of *Lecanicillium muscarium* with insecticides for eradication of *Bemisia tabaci* on poinsettia plants. 3rd European Whitefly Symposium, Aguadulce, Spain. 20-24th October 2008. pp.129.

52. Cuthbertson, A.G.S., Mathers, J.J., Northing, P., **Luo, W.** & Walters, K.F.A. (2008). *Steinernema carpocapsae*: Efficacy against *Bemisia tabaci* instars and compatibility with chemical insecticides. 3rd European Whitefly Symposium, Aguadulce, Spain. 20-24th October 2008. pp.130.

53. **Luo, W.**, Parker, S.R., & Taylor, M.C. (2008). Predicting annual and regional disease fluctuations for winter wheat – development and application of new approaches. BSPP Presidential Meeting – Cereal pathosystems, Queen Mary, University of London, UK, pp. 8.

54. **Luo, W.**, Baxter, P.D., & Taylor, C.C. (2007). Regression models for high dimensional data with correlated error. In: *Systems Biology & Statistical Bioinformatics* (Eds: Barber, S., Baxter, P.D. & Mardia, K.V.), Leeds University Press, Leeds, UK. pp. 116-119.

55. **Luo, W.**, Baxter, P.D. & Taylor, C.C. (2006). Regression models for high dimensional data - a simulation study. In: *Interdisciplinary Statistics and Bioinformatics* (Eds: Barber, S., Baxter, P.D., Mardia, K.V. & Walls, R.E.), Leeds University Press, Leeds, UK. Pp. 128-131.

56. **Luo, W**. (2009), 'Spatial/Temporal modelling of crop disease data using high-dimensional regression', HGCA online report, Pp. 1-33. Available at: www.hgca.com/media/267590/sr15.pdf

57. C.T. Ramwell, W. van Beinum, A. Rowbothan, H. Parry, S.A. Parsons, **W. Luo**, G. Evans, Ptaquiloside and other bracken toxins: a preliminary risk assessment, Final Report, The Food and Environmental Research Agency, Sand Hutton, 2010.

Published Book Reviews:

- **Luo, W.** (2009). Book review for the *Journal of Applied Statistics*, "Analysing Ecological Data", by Zuur, A.F., Ieno, E.N., & Smith, G.M., **36**, 233-234.
- **Luo, W.** (2007). Book review for the *Journal of Applied Statistics*, "Generalized Additive Models: An Introduction with R", by Wood, S.N., **34**, 641-642.

Thesis:

- **Luo, W.** (2009). Predicting annual and regional fluctuations in crop health – development and application of new approaches, University of Leeds, PhD thesis.206pp.

Awards:

Invited to attend Press conference in USDA Headquarter, DC for recognized contribution for 'Making the Eradication of Plum Pox Virus from the United States' with award certificate. 10/17/2020

Invited speaker to Argentina to present ‘HLB risk-based model’ to Citrus Association, INTA and SENASA, with recognized contribution for ‘HLB management in Concordia’. 04/05/2018

Lauren E. Quevillon
Morrisville, North Carolina
lauren.quevillon@gmail.com | (860) 208-8003

SUMMARY

I am a broadly-trained pest and disease ecologist with a passion for synthesizing data to drive decision-making. In my current role as an analyst and project leader on academic-government collaborations, I have gained extensive experience in efficiently distilling information and developing data systems to guide U.S. plant biosecurity activities. I have a background in infectious disease modeling, data analysis, and experimental design, with experience and aptitude for communicating with a wide array of stakeholders.

EDUCATION

Pennsylvania State University 2012 - 2018
Eberly College of Science State College, PA
Ph.D. in Biology
Thesis: “The ecology, epidemiology, and evolution of parasites infecting ants (Hymenoptera: Formicidae)”
Thesis Advisor: Dr. David Hughes

Cornell University 2006 - 2010
College of Arts and Sciences Ithaca, NY
B.A. in Biological Sciences

PROFESSIONAL EXPERIENCE

North Carolina State University 2018 - present
NSF Center for Integrated Pest Management Raleigh, NC

Research Scholar, New Pest Response Guidelines (NPRG) project (Nov. 2021 – present)
Analyst and Co-PI, Objective Prioritization of Exotic Pests (OPEP) project (Jan. 2021 – present)

- Literature reviews: Became the in-house subject matter expert on a variety of taxonomically diverse plant pests (ranging from viruses to insects) by efficiently deep-diving through all available literature.
- Data consolidation and analysis: Evaluated data quality and consolidated evidence about pest biology, damage, potential impact, and effective mitigation strategies.
- Survey design: Consulted with statisticians and modelers to design pest detection and delimitation surveys and wrote survey instructions for deployment by federal and state surveyors.
- Synthesis and action: Synthesized information and wrote concise impact assessments and response guidelines. These assessments prioritized pests based on their predicted impact if introduced to the U.S. and provided survey and mitigation guidelines for use immediately following introductions, which facilitated the efficient use of USDA resources and funding.
- Team management: Coached new and veteran analysts on literature review techniques, evidence evaluation, and concise synthesis for stakeholders. Ensured project deliverables were met and facilitated communication between academic and government collaborators.

Analyst and Co-PI, Global Pest and Disease Database (GPDD) project (Nov. 2018 - Nov. 2021)

- Literature reviews: Conducted extensive literature reviews (searched/digested/analyzed 100+ papers per week) on hundreds of taxonomically diverse plant pests and pathogens. Evaluated data quality, and entered information on biology, host associations, impact, and management into a secure USDA database of 6,000+ pests of concern to U.S. agriculture.
- Data curation: Refined and implemented data capture and organization protocols based on feedback from USDA stakeholders and in consultation with developers.
- Quality control: Developed and implemented quality control protocols to ensure standardized data capture protocols and data quality across analysts.

• Team management: Managed a team of six analysts, allocated analyst resources based on dynamic project priorities, trained new analysts on data capture protocols, and facilitated intra- and inter-team communication and consensus-building.

RESEARCH EXPERIENCE

Pennsylvania State University 2012 - 2018
Center for Infectious Disease Dynamics State College, PA
Graduate Research Assistant

• Database development: Developed a database of 2,000+ records of parasites infecting ants. Designed database vocabulary and refined curation protocols. Synthesized literature to analyze trends in parasite and ant ecological + epidemiological traits that were then used to build disease models.
• Disease modeling: Created, validated, and analyzed mathematical models (deterministic and stochastic compartmental models) of parasites infecting ant colonies to predict conditions resulting in colony collapse. Wrote and ran scripts in R, and visualized and interacted with data in R and Shiny.
• Data analysis: Gained extensive experience analyzing data from lab and field experiments in R (primarily social network analysis, linear models, survival analysis, summary statistics)
• Lab + field work: Performed lab experiments on ant behavioral ecology and social interactions to understand how colony organization impacts disease transmission. Maintained fungal cultures and helped develop ant infection protocols. Conducted field work and coordinated logistics in Brazil, Costa Rica, Mozambique, and the United States.
• Mentoring: Mentored several undergraduate research students in ant behavior, social network analysis, and mathematical modeling of infectious diseases.

Cornell University Summer 2008 - 2010
Shoals Marine Laboratory Appledore Island, ME
Undergraduate Researcher

• Field work: Surveyed parasite prevalence in a marine snail population at multiple field sites. Laid transects and set up field experiments to identify ecological divers of snail parasitism while enduring relentless attacks from gulls.
• Data analysis: Performed statistical analyses to analyze survey and experimental data.

Cornell University 2009 - 2010
College of Veterinary Medicine Ithaca, NY
Undergraduate Researcher

• Survey design: Designed sampling plans for surveying invertebrates for their potential role in the life cycle of helminth parasites.
• Assay development: Developed molecular assays to detect parasite presence in invertebrate samples.

TEACHING EXPERIENCE

Pennsylvania State University Eberly College of Science
Science-U Camp Director and Instructor 2015 - 2018

• Designed, developed and instructed a week-long science camp about infectious disease ecology and epidemiology for ~25 high school students.

Pennsylvania State University
Department of Biology
Graduate Teaching Assistant Fall 2013, 2014

• Instructed two sections of BIOL 110 (Introductory Biology Lab) and one section of BIOL 464 (Sociobiology). Helped design course material and deliver lectures.

Boys' Latin School of Maryland 2011 - 2012
Upper School Science Instructor Baltimore, MD
• Taught five sections of Honors Chemistry + Chemistry and served as a freshman class advisor.

Marianapolis Preparatory School 2010 - 2011
Chemistry Teacher Thompson, CT
• Taught five sections of Honors Chemistry + Chemistry, coached Girls' Varsity Soccer and Lacrosse teams, mentored the Science Bowl team, and served as a freshman class and residential advisor.

PUBLICATIONS
Academic Publications
• Quevillon, L.E. and D.P. Hughes. 2018. Pathogens, parasites, and parasitoids of ants- a review and synthesis of host records and parasite biology. bioRxiv. doi: https://doi.org.10.1101/384495.
• Hughes, D.P., J.P.M. Araujo, R.G. Loreto, L.E. Quevillon, C. de Bekker, and H.C. Evans. 2016. From so simple a beginning: The evolution of behavioral manipulation by fungi. Advances in Genetics 9, 437-469.
• Quevillon, L.E., E.M. Hanks, S. Bansal, and D.P. Hughes. 2015. Social, spatial, and temporal organization in a complex insect society. Scientific Reports 5, 13393.
• Byers, J.E., A.J. Malek, L.E. Quevillon, I. Altman, and C.L. Keough. 2015. Opposing selective pressures decouple pattern and process of parasitic infection over small spatial scale. Oikos 124(11), 1511-1519.
• de Bekker, C., L.E. Quevillon, P.B. Smith, K.R. Fleming, D. Ghosh, and D.P. Hughes. 2014. Species-specific ant brain manipulation by a specialized fungal parasite. BMC Evolutionary Biology 14(1), 166

Government Publications
• Cook, J.C. and L.E. Quevillon. 2022. New Pest Response Guidelines. *Hymenoscyphus fraxineus*— Ash dieback. U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Washington, D.C.
• Quevillon, L.E., I. Pulakkatu-thodi, and J.C. Cook. 2022. New Pest Response Guidelines. *Crocidosema aporema* — Soybean bud borer. U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Washington, D.C.
• Cook, J.C., L.E. Quevillon, and J.B. van Kretschmar. 2022. New Pest Response Guidelines. *Autographa gamma* — Silver Y moth. U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Washington, D. C.
• Cook, J.C., L.E. Quevillon, and J.B. van Kretschmar. 2022. New Pest Response Guidelines. *Tecia solanivora* — Guatemalan potato tuber moth. U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Washington, D. C.
• Quevillon, L.E. 2022. Objective Prioritization of Exotic Pests (OPEP) Impact Assessment for *Curculio elephas* (Curculionidae): Chestnut weevil. United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine (PPQ), Raleigh, NC
• Quevillon, L.E. 2021. Objective Prioritization of Exotic Pests (OPEP) Impact Assessment for *Alternaria jacinthicola* (Pleosporaceae). United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine (PPQ), Raleigh, NC
• Quevillon, L.E. 2021. Objective Prioritization of Exotic Pests (OPEP) Impact Assessment for *Arboridia kakogawana* (Cicadellidae): Japanese grape leafhopper. United States Department of

Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine (PPQ), Raleigh, NC
- Quevillon, L.E. 2021. Objective Prioritization of Exotic Pests (OPEP) Impact Assessment for *Cercospora apiicola* (Mycosphaerellaceae). United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine (PPQ), Raleigh, NC
- Quevillon, L.E. 2021. Objective Prioritization of Exotic Pests (OPEP) Impact Assessment for *Fijivirus Fiji disease virus* (Reoviridae): Fiji leaf gall. United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine (PPQ), Raleigh, NC
- Quevillon, L.E. 2021. Objective Prioritization of Exotic Pests (OPEP) Impact Assessment for *Monosteira unicostata* (Tingidae). United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine (PPQ), Raleigh, NC
- Quevillon, L.E. 2021. Objective Prioritization of Exotic Pests (OPEP) Impact Assessment for *Oxycarenus lavaterae* (Oxycarenidae): Mediterranean linden bug. United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine (PPQ), Raleigh, NC
- Quevillon, L.E. 2021. Objective Prioritization of Exotic Pests (OPEP) Impact Assessment for *Poacevirus Sugarcane streak mosaic virus* (Potyviridae): SCSMV. United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine (PPQ), Raleigh, NC
- Quevillon, L.E. 2021. Objective Prioritization of Exotic Pests (OPEP) Impact Assessment for *Scirpophaga incertulas* (Crambidae): Yellow stem borer. United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine (PPQ), Raleigh, NC
- Quevillon, L.E. 2021. Objective Prioritization of Exotic Pests (OPEP) Impact Assessment for *Scirtothrips aurantii* (Thripidae): South African citrus thrips. United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine (PPQ), Raleigh, NC
- Quevillon, L.E. 2021. Objective Prioritization of Exotic Pests (OPEP) Impact Assessment for *Stephanitis typica* (Tingidae): Banana lace-wing bug. United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine (PPQ), Raleigh, NC
- Quevillon, L.E. 2021. Objective Prioritization of Exotic Pests (OPEP) Impact Assessment for *Tetranychus abacae* (Tetranychidae). United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine (PPQ), Raleigh, NC

SKILLS
- Statistical analysis (regression, linear models, survival analysis, basic summary statistics) and data visualization (R)
- Social network analysis and visualization
- Mathematical modeling (deterministic and stochastic compartmental modeling)
- Programming (R, Python)
- Insect behavioral assays
- Insect field collection and rearing
- Project leadership, team management

PRESENTATIONS
Entomological Society of America Annual Meeting, Denver, CO 2017
Penn State Center for Infectious Disease Dynamics, State College, PA 2014, 2016
Ecological Society of America Annual Meeting, Baltimore, MD 2015
Conference on Complex Systems, Phoenix, AZ 2015
Keynote Speaker- Penn State's 'Expanding Your Horizons' workshop 2015
Society for General Microbiology Annual Meeting, Liverpool, UK 2014

Oxford University, Department of Zoology, Oxford, UK 2014
Cambridge University, Department of Zoology, Cambridge, UK 2014

FELLOWSHIPS

National Science Foundation Graduate Research Fellowship 2014 - 2017
Paul and Harriet Campbell Distinguished Graduate Fellowship, Pennsylvania State University 2012 - 2013
University Graduate Fellowship, Pennsylvania State University 2012 - 2013

AWARDS AND HONORS

Entomological Society of America Student Competition Winner (2nd place, SysEB) 2017
Cornell University College of Arts and Sciences 'Distinction in All Subjects' 2010
Cornell University Dean's List 2008 - 2010
Shoals Marine Laboratory Bartels Merit Scholarship 2007

LEADERSHIP AND SERVICE

Leadership

- President: Center for Infectious Disease Dynamics Graduate Student Association 2014 - 2016
- Vice President: Center for Infectious Disease Dynamics Graduate Student Association 2013 - 2014

Service

- Reviewer: Scientific Reports, Journal of Behavioral Ecology
- Committee Member: NCSU CIPM's Continuous Improvement and Seminars Plus committees
- Guest Lecturer: North Carolina public schools (Hoke, Moore, MacDowell, Onslow, and Wake counties), Pennsylvania public schools (Centre county), Connecticut public schools (Windham county)
- Volunteer: Penn State University's Great Insect Fair 2012 – 2014

Roger D. Magarey
Senior Researcher
Center for IPM
North Carolina State University
1730 Varsity Drive, Suite 110
Raleigh, NC, 27606
Ph: (919) 515-3207 Fax: (919) 513-1114
E-mail: rdmagare@ncsu.edu

EDUCATION

1999. Ph.D. - Plant Pathology, Cornell University, New York, USA. Graduate Adviser: Dr. Robert Seem. Thesis project: A theoretical standard for the measurement of leaf surface wetness duration.

1989 Bachelor of Agricultural Science (Hons.) The University of Adelaide, Australia. Graduate adviser: Dr. Bryan Coombe. Thesis project: The effect of pre- and post-harvest fungicide sprays on the post-harvest physiology of pears.

PROFESSIONAL EXPERIENCE

2021- Co-Director of Southern IPM Center and Principal Researcher at Center for IPM.

2015-20 Senior Researcher, Plant Pathologist, NCSU Center for Integrated Pest Management (CIPM), NCSU. Research leader for the integrated Pest Information Platform (iPiPE). Development of predictive models for pest forecasting and risk analysis.

2003-14 Senior Researcher, Plant Pathologist, NCSU Center for Integrated Pest Management (CIPM), NCSU and cooperator at the Center for Plant Health Science and Technology, USDA-APHIS-PPQ.

- Develop the NAPPFAST NCSU APHIS Plant Pest Forecast system.
- Coordinate the activities of research scientists to develop new information tools for risk analysis including those for pest, spatial and climate analysis.
- Prepare proposals, work plans and reports to manage APHIS-PPQ cooperative agreements. Write scientific papers on key research and development findings.
- Supervise cooperators, staff and sub-contractors working on cooperative agreements.
- Organize meetings or conference calls to bring together cooperators and stakeholders for mission critical projects.
- Provide risk analysis products as directed by APHIS-PPQ.

2002-02 Extension Associate, Department of Plant Pathology, NCSU. Site-specific management of peanuts and weather-based pest risk assessment.

- Developed disease warning system for peanuts

1994-99 Post-doctoral and Graduate Research Assistant, Department of Plant Pathology, Cornell University.

- Developed a standard measurement for leaf wetness,
- Created simulation models for leaf wetness for grapevine.

SELECTED PUBLICATIONS

Gottwald, T.R., E.L. Taylor, L. Amorim, A. Bergamin-Filho, R.B. Bassanezi, G.J. Silva, G. Fogliata, P.H. Fourie, J.H. Graham, V. Hattingh, A.B. Kriss, W. Luo, R.D. Magarey, G.C. Schutte, M.B. Spósito. 2021. Probabilistic risk-based model for the assessment of Phyllosticta citricarpa-infected citrus fruit and illicit plant material as pathways for pathogen introduction and establishment, Crop Protection142:105521.

Magarey, R.D., and Trexler, C.M. (2020) Information: a missing component in understanding and mitigating social epidemics. Humanities and Social Science Communications 7, 128. https://doi.org/10.1057/s41599-020-00620-w

Chappell, T. M., Magarey, R. D., Kurtz, R. W., Trexler, C. M., Pallipparambil, G. R., and Hain, E. F. (2019). Perspective: service-based business models to incentivize the efficient use of pesticides in crop protection. Pest Management Science, 75(11), 2865-2872. https://doi.org/10.1002/ps.5560

Magarey, R. D., Klammer, S. S., Chappell, T. M., Trexler, C. M., Pallipparambil, G. R., and Hain, E. F. (2019). Eco-efficiency as a strategy for optimizing the sustainability of pest management. Pest Management Science, 75(12), 3129-3134. https://doi.org/10.1002/ps.5560

Magarey, R.D., Chappell, T.M., Trexler, C.M., Pallipparambil, G.R. and Ernie F Hain, (2019). Social Ecological System Tools for Improving Crop Pest Management, Journal of Integrated Pest Management, 10:2 https://doi.org/10.1093/jipm/pmz004

Magarey, R., Newton, L., Hong, S.C., Takeuchi, Y., Christie, D., Jarnevich, C.S., Kohl, L., Damus, M., Higgins, S.I., Millar, L. and Castro, K., (2018). Comparison of four modeling tools for the prediction of potential distribution for non-indigenous weeds in the United States. Biological Invasions 20: 679-694.

Donatelli, M., Magarey, R. D., Bregaglio, S., Willocquet, L., Whish, J. P. M., and Savary, S. (2017). Modelling the impacts of pests and diseases on agricultural systems. Agricultural Systems. 155:215-224

Magarey, R.D. and Isard, S.A. (2017). A troubleshooting guide for mechanistic plant pest forecast models. Journal of Integrated Pest Management 8:3

JACOB BANT (JAAP) VAN KRETSCHMAR
Raleigh, NC 984-895-0007 jaap.vankretschmar@usda.gov jbkretsc@ncsu.edu

Research Scholar with North Carolina State University Center for Integrated Pest Management. Principal Investigator for NCSU CIPM/USDA-APHIS-PPQ and CIPM/US AID projects. Coordinate and provide analysis for agricultural plant-pest projects.

EDUCATION

Ph.D., North Carolina State University, Raleigh, NC, 2010 (Major: **Entomology**; Minor: Biotechnology)
Master of Science, NCSU, Raleigh, NC, 1995 (Major: **Soil Science**; Minor: Statistics)
Bachelor of Science, Purdue University, West Lafayette, IN, 1985 (Major: **Agronomy**)

PROFESSIONAL EXPERIENCE

North Carolina State University – Center for Integrated Pest Management
Raleigh, NC August 2013–Present

● ANALYST, USDA-APHIS-PPQ Exotic Plant Pest Monitoring ("PestLens" database and web application) 2021-Present
● PRINCIPAL INVESTIGATOR, USDA-APHIS-PPQ Exotic Plant Pest Monitoring ("PestLens" database and web application) 2019-2021
- PRINCIPAL INVESTIGATOR, US AID/VA Tech IIL (IPM Innovations Lab) East Africa Groundnut leafminer project, 2017-2021

● RESEARCH SCHOLAR, USDA-APHIS New Pest Response Guidelines (NPRGs), 2014 – 2021
● PRINCIPAL INVESTIGATOR, USDA-APHIS-PPQ NAPPRA (Not Approved Pending Pest Risk Analysis) import-prohibition pest datasheets project, 2014-2020
● POSTDOCTORAL RESEARCH ASSOCIATE, USDA-APHIS NPRGs, 2013-2014

North Carolina State University – Department of Entomology
Raleigh, NC March 2004–August 2013

● POSTDOCTORAL RESEARCH ASSOCIATE, October 2010–July 2013
● RESEARCH ASSISTANT, May 2010–September 2010
● GRADUATE RESEARCH & TEACHING ASSISTANT, July 2006–May 2010
● RESEARCH TECHNICIAN, March 2004–July 2006

Bayer CropScience – Department of Residues: Soil and Water
Research Triangle Park, NC October 2003–March 2004

● CONTRACT WRITER, October 2003–March 2004

Bayer CropScience (formerly Aventis CropScience, formerly Rhône-Poulenc Ag Co.)
Research Triangle Park, NC July 1991 – October 2003

● RESEARCH SCIENTIST (STUDY DIRECTOR & PRINCIPAL ANALYTICAL INVESTIGATOR), January 2001–October 2003
● RESEARCH SCIENTIST (STUDY DIRECTOR), January 2000–January 2001
● ASSOCIATE RESEARCH SCIENTIST, May 1999–January 2000
● SCIENTIST, December 1995-May 1999
● RESEARCH ASSISTANT, July 1991-December 1995

North Carolina State University – Crop Science Department
Raleigh, NC August 1988–May 1991

● GRADUATE RESEARCH ASSISTANT, August 1988 – May 1991

CIBA-GEIGY Agricultural Biotechnology Research Unit
Raleigh, NC April 1986–August 1988

● RESEARCH TECHNICIAN, April 1986–August 1988

PUBLICATIONS

Refereed Journal Articles

● Zhu, J., A. Dhammi, **J.B. van Kretschmar**, E.L. Vargo, C.S. Apperson, and R.M. Roe. 2017. Novel use of aliphatic n-methyl ketones as a fumigant and alternative to methyl bromide for insect control. Pest Management Science doi: 10.1002/ps.4749

● Dhammi, A., **J.B. van Kretschmar**, L. Ponnusamy, J.S. Bacheler, D.D. Reisig, A. Herbert, A. I. Del Pozo-Valdivia, and R.M. Roe. 2016. Biology, pest status, microbiome and control of kudzu bug (Hemiptera: Heteroptera: Plataspidae): A new invasive pest in the U.S. Int. J. of Mol. Sci. http://www.mdpi.com/1422-0067/17/9/1570/htm

● **van Kretschmar, B**., A. R. Cabrera, J. R. Bradley and R. M. Roe. 2013. Novel adult feeding disruption test (FDT) to detect insecticide resistance of lepidopteran pests in cotton. Pest Management Sci. 69:652-660

● **van Kretschmar, J.B.**, W.D. Bailey, C. Arellano, G.D. Thompson, C.L. Sutula and R.M. Roe. 2011. Feeding disruption tests for monitoring the frequency of larval lepidopteran resistance to Cry1Ac, Cry1F, and Cry1Ab. Crop Protection 30: 863-870

● Magalhaes, L. C., **J. B. van Kretschmar**, K. V. Donohue and R. M. Roe. 2013. Pyrosequencing of the adult tarnished plant bug, *Lygus lineolaris*, and characterization of messages important in metabolism and development. Entomol. Exp. Appl. 146: 364–378

● Magalhaes, L.C., **J.B. Van Kretschmar**, V.M. Barlow, R.M. Roe and J.F. Walgenbach. 2012. Development of a rapid resistance-monitoring bioassay for codling moth larvae. Pest Management Science 68: 883-888

● Cabrera, A.R., **J. van Kretschmar**, J.S. Bacheler, H. Burrack, C.E. Sorenson and R.M. Roe. 2011. Resistance monitoring of *Heliothis virescens* to pyramided cotton varieties with a hydratable, 'artificial cotton leaf' bioassay. Crop Protection 30: 1196-1201

USDA-APHIS-PPQ Technical Documents

● **van Kretschmar**, J.B. 2017. New Pest Response Guidelines. *Cydalima perspectalis* (Lepidoptera: Crambidae) (Walker, 1859) Box Tree Moth. U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.

- Cook, J.C. and J.B. **van Kretschmar**. 2017. New Pest Response Guidelines. '*Candidatus* Phytoplasma phoenicium' Verdin et al. Almond Witches'-Broom. U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.
- Cook, J.C. and J.B. **van Kretschmar**. 2017. New Pest Response Guidelines. *Cryptoblabes gnidiella* (Lepidoptera: Pyralidae) (Millière, 1867). Christmas Berry Webworm. U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.
- Cook, J.C. and J.B. **van Kretschmar**. 2017. New Pest Response Guidelines. *Eurygaster integriceps* Puton (Hemiptera: Scutelleridae) Sunn Pest. U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.
- Cook, J.C. and J.B. **van Kretschmar**. 2017. New Pest Response Guidelines. *Rhagoletis cerasi* (Linnaeus) European Cherry Fruit Fly. U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.

- Cook, J.C. and J.B. **van Kretschmar**. 2017. New Pest Response Guidelines. *Thaumatotibia leucotreta* (Meyrick) False Coddling Moth. U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.
- Bloem, S., J.C. Cook, G.R. Pallipparambil, E. Spaltenstein, and J.B. **van Kretschmar**. 2017. New Pest Response Guidelines. *Tuta absoluta* (Meyrick) Tomato Leafminer. U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.

● **van Kretschmar,** J. B. 2015. New Pest Response Guidelines *Unaspis yanonensis* (Hemiptera: Diaspididae) Arrowhead scale. USDA-APHIS-PPQ. Available at http://www-author.aphis.usda.gov/import_export/plants/manuals/emergency/downloads/nprg-arrowhead-scale.pdf

● **van Kretschmar,** J. B. 2015. New Pest Response Guidelines *Massicus raddei* (Blessig) (Coleoptera: Cerambycidae) Mountain Oak Long-horned Beetle. USDA-APHIS-PPQ

● **van Kretschmar,** J. B., J. A. Hardin, and K. Maguylo. 2014. New Pest Response Guidelines *Helicoverpa armigera* (Hübner) Old World Bollworm. USDA-APHIS-PPQ. Available at http://www.aphis.usda.gov/import_export/plants/manuals/emergency/downloads/NPRG_H_armigera.pdf

Proceedings Papers

● **van Kretschmar**, J. B., A. Dhammi, and R.M. Roe. 2013. New mechanism for Bt resistance in caterpillars, pp. 892-896. *In* Proceedings Beltwide Cotton Conferences, San Antonio, Texas, Jan. 8-10, 2013. National Cotton Council, Memphis, TN

● **van Kretschmar, J.B.**, K.V. Donohue, A.R. Cabrera, L.C. Magalhaes, C.E. Sorenson, J.S. Bacheler, S.M.S. Khalil and R.M. Roe. 2012. Illumina® sequencing of green stink bug nymph and adult cDNA to identify potential RNAi gene targets, pp. 1090-1096. *In* Proceedings Beltwide Cotton Conferences, National Cotton Council, Memphis, TN

● **van Kretschmar, J.B.**, J.R. Bradley, A.R. Cabrera and R.M.Roe**.** 2011. Lepidopteran adult feeding disruption test (FDT) to detect insecticide resistance, pp. 1010-1015. *In* Proceedings Beltwide Cotton Conferences, National Cotton Council, Memphis, TN

● **van Kretschmar, J.B.**, A. Dhammi, D. Reisig and R.M.Roe. 2011. Challenges for rearing of the stink bug: Successes, failures and RNAi screening, pp. 1169-1175. *In* Proceedings Beltwide Cotton Conferences, National Cotton Council, Memphis, TN

● **van Kretschmar, J.B.**, K.V. Donohue, A.R. Cabrera, L.C. Magalhaes, C.E. Sorenson, J.S. Bacheler, S.M.S. Khalil and R.M. Roe. 2010. Transcriptomics by massive parallel pyrosequencing of the green stink bug: Functional gene ontology and new targets for control, pp. 1195-1202. *In* Proceedings Beltwide Cotton Conferences, National Cotton Council, Memphis, TN

● **van Kretschmar, J.B.**, L.C. Magalhaes, J. Zhu, A.C. Cohen and R.M. Roe. 2009. Feasibility of a novel feeding disruption test (FDT) bioassay kit for rapid resistance detection of sucking pests of cotton, pp. 882-892. *In* Proceedings Beltwide Cotton Conferences, National Cotton Council, Memphis, TN

● **van Kretschmar, J.B.**, J.R. Bradley, A.R. Cabrera and R.M. Roe. 2008. Novel adult assay to detect insecticide resistance of lepidopteran pests in cotton, pp. 1329-1336. *In* Proceedings Beltwide Cotton Conferences, National Cotton Council, Memphis, TN

● **van Kretschmar, J.B.**, J.R. Bradley, C.F. Stumpf and R.M. Roe. 2007. Feasibility of adult feeding disruption tests (FDT) for monitoring lepidopteran resistance to chemical insecticides, pp. 136–140. *In* Proceedings Beltwide Cotton Conferences, National Cotton Council, Memphis, TN

● **van Kretschmar, J.B.** and J.B. Weber. 1991. Relative mobilities of chlorimuron and imazaquin in soil from the southern region. Proceedings Southern Weed Science Society 44:408

● Roe, R.M., A. Dhammi, L. Ponnusamy, **J.B. van Kretschmar**, and R.W. Kurtz. 2014. Potential New Mechanism for Insect Cross Resistance to Different Protein/dsRNA Toxins, pp. 878-885. *In* Proceedings Beltwide Cotton Conferences, New Orleans, LA, January 6-8, 2014. National Cotton Council, Memphis, TN

● Abdelall, M. F., S. Taylor, **J. van Kretschmar**, S. M. S. Khalil, T. Z. Salem and R. M. Roe. 2013. Transcriptomic analysis of the larval head of the Egyptian cotton leafworm, pp. 221-226. *In* Proceedings Beltwide Cotton Conferences, San Antonio, Texas, Jan. 8-10, 2013. National Cotton Council, Memphis, TN

● Roe, R.M., S. Taylor, **J. van Kretschmar**, G.G. Kennedy, A. Dhammi, C.E. Sorenson and J.S. Bacheler. 2013. RNAi control of tobacco thrips: Illumina transcriptomics, pp. 1185-1192. *In* Proceedings Beltwide Cotton Conferences, San Antonio, Texas, Jan. 8-10, 2013. National Cotton Council, Memphis, TN

● Roe, R.M., A.R. Cabrera, H. Ezzeldin, **J.B. van Kretschmar**, and B.W. Bissinger. 2011. Broad-spectrum biosensor for monitoring current and future transgenic plant technologies for insect control, pp. 1153-1159. *In* Proceedings Beltwide Cotton Conferences, National Cotton Council, Memphis, TN

● Cabrera, A.R., **J. Van Kretschmar**, J.S. Bacheler, H.J. Burrack, C.E. Sorenson and R.M. Roe. 2010. Development of hydrateable, commercially-relevant artificial cotton leaves and assay architecture for monitoring insect resistance to Bt, pp. 1290-1296. *In* Proceedings Beltwide Cotton Conferences, National Cotton Council, Memphis, TN

● Roe, R.M., K.V. Donohue, L.C. Magalhaes and **Jaap Van Kretschmar**. 2009. First 454 trancscriptome to the plant bug digestive system: new leads for next generation transgenic cotton to control sucking pests, pp. 1152-1158. *In* Proceedings Beltwide Cotton Conferences, National Cotton Council, Memphis, TN

● Roe, R.M., **J.B. van Kretschmar**, D.M. Thompson, K.V. Donohue, C.E. Sorenson, F. Gould, C.F. Stumpf, J.W. Van Duyn, G.D. Thompson, N.P. Storer, C. Blanco, J.D. Lopez Jr, B.R. Leonard, A. Kilpatrick, A. Hagerty and D. Brickle. 2005. Larval feeding disruption test (FDT) for monitoring insect resistance to Cry1Ab, Cry1Ac and Cry1F, pp. 1651-1661. *In* Proceedings Beltwide Cotton Conferences, National Cotton Council, Memphis, TN

● Ferbeck, P., **J.B. van Kretschmar**, R.G. Blenk and H.M.Ayad. 1997. Performance of Larvin® brand thiodicarb and four other insecticides against tobacco budworm collected from different sites in the USA cotton belt, pp. 1101-1105. *In* Proceedings Beltwide Cotton Conferences, National Cotton Council, Memphis, TN

● Thieyre, V., **J.B. van Kretschmar**, R.G. Blenk and H.M. Ayad. 1995. Performance of Larvin® against resistant and susceptible populations of tobacco budworm collected from different sites of the cotton belt, pp. 68-70. *In* Proceedings Beltwide Cotton Conferences, National Cotton Council, Memphis, TN

● Beigel, C., **J.B. van Kretschmar**, R.G. Blenk and H.M. Ayad. 1994. Toxicity of Larvin® brand thiodicarb and three other insecticides to tobacco budworm collected in 1993 from different sites in the USA cotton belt, pp. 943-946. *In* Proceedings Beltwide Cotton Conferences, National Cotton Council, Memphis, TN

Presentations

- **van Kretschmar, J. B**. 2019. Informing an emergency response to the detection of a non-native plant-pest insect in the landscape. IPPC XIX International Plant Protection Congress, IPPC 2019, Hyderabad, India, 10-14 November 2019.
- **van Kretschmar, J**., S. Emerine, and T. P. Lynch. 2019. Pest datasheets for NAPPRA (Not Approved [for importation] Pending Pest Risk Analysis). Presentation during Cochran Fellowship Program on Resilient Agriculture, NCSU CIPM, Raleigh NC, 3 June 2019.

- **van Kretschmar, J.B.** and G.R. Pallipparambil. 2018. NCSU CIPM pest-management database and modeling capabilities. Department of Agriculture, University of Zululand, KwaDlangezwa, South Africa, 13 December 2018.

● Pallipparambil, G.R. and **Jaap van Kretschmar.** 2017. Preventing the introduction of exotic fruit flies: preparedness. Third International Congress on Biological Invasions (ICBI). Hangzhou, China, November 19-23, 2017.

● **van Kretschmar, J.B.** and K. Suiter. 2016. New Pest Response Guidelines (USDA-APHIS-NPRG): Response options to a potential US invasion by a West and Central Asian pest of wheat and barley. XXV International Congress of Entomology, Orlando, FL, USA, September 25-30, 2016

● **Joint presentation: Pallipparambil, G.R., J.B. van Kretschmar,** G.L. Cave, and K. Suiter. 2014. New pest response guidelines: A field reference for emergency response to high priority invasive pests. Annual Meeting of the Entomological Society of America, Portland, OR, November 16-19, 2014

● **van Kretschmar, J.B.**, K.V. Donohue, A.R. Cabrera, L.C. Magalhaes, C.E. Sorenson, J.S. Bacheler, S.M.S. Khalil and R.M. Roe. 2014. Illumina® sequencing of green stink bug nymph and adult cDNA to identify potential RNAi gene targets. Connecting PERAL presentation, USDA Plant Epidemiology and Risk Analysis Laboratory, Raleigh, NC, September 11, 2014

● **van Kretschmar, J.B.** 2014. Writing in the biological sciences: Genres & their audiences. North Carolina State University SWAP (STEM & Writing Annual Partnership) Program presentations and classroom exercises, Raleigh, NC, September 4, 2014

● **van Kretschmar, J.B.**, K.V. Donohue, A.R. Cabrera, L.C. Magalhaes, C.E. Sorenson, J.S. Bacheler, S.M.S. Khalil and R.M. Roe. 2012. Illumina® sequencing of green stink bug nymph and adult cDNA to identify potential RNAi gene targets. Beltwide Cotton Conferences, Orlando, FL, January 3-6, 2012

● **van Kretschmar, J.B.**, A. Dhammi, D. Reisig and R.M.Roe. 2011. Challenges for rearing of the stink bug: Successes, failures, and RNAi screening. Beltwide Cotton Conferences, Atlanta, GA, January 4-7, 2011

● **van Kretschmar, J.B.**, J.R. Bradley, A.R. Cabrera and R.M.Roe. 2011. Lepidopteran adult feeding disruption test (FDT) to detect insecticide resistance. Beltwide Cotton Conferences, Atlanta, GA, January 4-7, 2011

● **van Kretschmar, J.B.**, K.V. Donohue, A.R. Cabrera, L.C. Magalhaes, S.M.S. Khalil, J.S. Bacheler, C.E. Sorenson and R.M. Roe. 2010. Pyrosequencing of the first green stink bug tanscriptome to identify potential RNAi gene targets. North Carolina State University Entomology Graduate Student Symposium, Raleigh, NC, February 12, 2010

● **van Kretschmar, J.B.**, L.C. Magalhaes, J. Zhu, A.C. Cohen and R.M. Roe. 2009. Feasibility of a novel feeding disruption technology (FDT) bioassay kit for rapid resistance detection of sucking pests of cotton. Annual Meeting of the Entomological Society of America, Indianapolis, IN, December 13-16, 2009

● **van Kretschmar, J.B.**, L.C. Magalhaes, J. Zhu, A.C. Cohen and R.M. Roe. 2009. Feasibility of a novel feeding disruption test (FDT) bioassay kit for rapid resistance detection of sucking pests of cotton. Beltwide Cotton Production Research Conferences, San Antonio, TX, January 5-8, 2009

● **van Kretschmar, J.B.**, J.R. Bradley, A.R. Cabrera, and R.M. Roe. 2008. Novel adult assay to detect insecticide resistance of lepidopteran pests in cotton. Beltwide Cotton Production Research Conferences, Nashville, TN, January 8-11, 2008

● **van Kretschmar, J.B.**, J.R. Bradley, C.F. Stumpf and R.M. Roe. 2007. Feasibility of adult feeding disruption tests (FDT) for monitoring lepidopteran resistance to chemical insecticides. North Carolina State University Entomology Graduate Student Symposium, Raleigh, NC, March 16, 2007

● **van Kretschmar, J.B.** 1995. Determination of herbicide mobility in soil columns. Rhône-Poulenc Ag Co, Research Triangle Park, NC, November 13, 1995

● **van Kretschmar, J.B.**, H.M. Ayad, R.G. Blenk, M.M. Mohamed and E.E. Pantaloni. 1993. Performance of four insecticides against *Heliothis virescens* (tobacco budworm) collected from six sites in USA in 1992. Annual Meeting of the Entomological Society of America, Indianapolis, IN, December 12-15, 1993
● **van Kretschmar, J.B.** and J.B. Weber. 1991. Relative mobilities of chlorimuron and imazaquin in soils from the southern region. Annual Meeting, Southern Weed Science Society, San Antonio, TX, January 14-16, 1991
● **van Kretschmar, J.B.** and J.B. Weber. 1990. Herbicide mobility as measured in soil leaching columns in the laboratory. NCSU Agricultural Chemicals School and Annual Winter Meeting of the Pesticide Association of North Carolina, Raleigh, NC, December 8-9, 1990

Poster Presentations

● Zhu, J., A. Dhammi, **J.B. van Kretschmar**, and R. Michael Roe. 2013. Use of methyl ketones as a fumigant and replacement for methyl bromide. Student symposium, BASF, Research Triangle Park, NC, 4 Sept. 2013
● Abdelall, M. F., S. Taylor, **J. van Kretschmar**, S. M. S. Khalil, T. Z. Salem and R. M. Roe. 2013. Transcriptomic analysis of the larval head of the Egyptian cotton leafworm. Beltwide Cotton Conferences, San Antonio, Texas, Jan. 8-10
● **van Kretschmar, J.B.**, L.C. Magalhaes, J. Zhu, A.C. Cohen and R. Michael Roe. 2009. Feasibility of a novel feeding disruption bioassay kit for rapid detection of insecticide resistance in sucking pests of cotton. NCSU College of Agriculture and Life Sciences Graduate Student Research Symposium, Raleigh, NC
● Magalhaes, L.C., **J.B. van Kretschmar**, V.M. Barlow, R.M. Roe and J.F. Walgenbach. 2008. Development of a rapid resistance monitoring bioassay for codling moth. NCSU Molecular Biotechnology Research Symposium, Raleigh, NC
● **van Kretschmar, J.B.**, C.F. Stumpf and R.M. Roe. 2006. Feasibility of using Bt proteins in monitoring *H. virescens* adults for Bt resistance. Annual Meeting of the Southeastern Branch of the Entomological Society of America, Wilmington, NC, March 5-8, 2006

JENNIFER COLLEEN COOK (SHAFFER)

Raleigh, NC 27610 – 386- 266-8108

biocontrol.jennifer.cook@gmail.com

EDUCATION

- Doctor of Philosophy in Plant Pathology, University of Florida, Gainesville, FL, August 2006

DISSERTATION: Integrated Control of Dodder (Cuscuta pentagona Engelm.) Using Glyphosate, Ammonium Sulfate, and the Biological Control Agent Alternaria destruens Simmons, sp. nov.

- Master of Science in Horticulture, North Carolina State University, Raleigh, NC, May 2002

THESIS: The Evaluation of Two Bacterial Plant Pathogens, Xanthomonas campestris pv. poannua and Pseudomonas syringae pv. tagetis, as Biological Control Agents for Weed Management

- Bachelor of Science in Biology, Pennsylvania State University (Behrend College), Erie, PA, May 1991
- Associate of Science in Applied Health Science, Community College of the Air Force, Montgomery, AL 1996

PROFESSIONAL EXPERIENCE

June 2021-present: Co-Principal Investigator, Enhance Exotic Plant-Pest Mitigation and Response by Developing New Pest Response Guidelines

July 2019-present: Principal Investigator, North Carolina 22 Exotic Plant Pest Monitoring (PestLens)

Mar 1995–Present: Unit Education and Training Manager and Command Support Staff, North Carolina Air National Guard, 145th Medical Group, Charlotte, NC

Jul 1992–Jan 1995: Information Management Specialist, Air National Guard Readiness Center (ANGRC), Environmental Department, Andrews Air Force Base, MD

RECENT PUBLICATIONS

- Cook, J. C., C. Funaro, H. Fang, J. B. van Kretschmar, and R. Hallberg. 2021. New Pest Response Guidelines. Xanthomonas citri subsp. citri — Citrus canker. U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.
- Cook, J. C., C. Funaro, and L. Quevillon. 2021. New Pest Response Guidelines. Cocadviroid: Coconut cadang-cadang viroid — Cadang-cadang disease. U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.

- Cook, J. C., C. Funaro, and J. B. van Kretschmar. 2021. New Pest Response Guidelines. Citrus leprosis virus complex. U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.

- Cook, J. C., C. Funaro, L. Ferguson, and S. Reddiboyina. 2022. New Pest Response Guidelines. Potexvirus: Citrus yellow vein clearing virus. U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.

- Cook, J. C., L. Quevillon, and J. B. van Kretschmar. 2022. New Pest Response Guidelines. Autographa gamma — Silver Y moth. U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.

- Cook, J. C., L. Quevillon, and J. B. van Kretschmar. 2022. New Pest Response Guidelines. Tecia solanivora — Guatemalan potato tuber moth. U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.

- Cook, J. C. and Funaro, C. 2021. New pest response guidelines: Raffaelea quercivora (Japanese oak wilt) and Platypus quercivorus (oak ambrosia beetle). United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine.

- Cook, J. C., C. Funaro, and J. B. van Kretschmar. 2021. New pest response guidelines. Begomovirus: Cotton leaf curl Gezira virus. U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.

- Cook, J. C., C. Funaro, and J. B. van Kretschmar. 2021. New pest response guidelines. Begomovirus: Okra yellow mosaic Mexico virus. U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.

- Cook, J. C., C. Funaro, J. B. van Kretschmar, and H. Fang. 2021. New pest response guidelines. Citrus leprosis virus complex (CiLV). U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.

- Cook, J. C., C. Funaro, J. B. van Kretschmar, R. Hallberg, and H. Fang. 2021. New pest response guidelines. Xanthomonas citri subsp. citri (citrus canker). U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.

- Cook, J. C., C. Funaro, J. B. van Kretschmar, R. Hallberg, and C. Hicks. 2021. New pest response guidelines. Hemileia vastatrix Berk. & Broome (coffee leaf rust). U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.

- Cook, J. C., C. Funaro, J. B. van Kretschmar, and T. Culliney. 2021. New pest response guidelines. Cydalima perspectalis (Lepidoptera: Crambidae) (Walker, 1859) (box tree moth). U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.

- Hardin, T., D. McPhie, J. C. Cook, and C. Funaro. 2021. New pest response guidelines. Oxycarenus hyalinipennis (Costa) (cotton seed bug). U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.

- Cook, J. C. 2020. New pest response guidelines. ‘Candidatus Phytoplasma palmae’-related strain (16SrIV-D) (lethal bronzing disease). U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.

- Cook, J. C., C. Funaro, J. B. van Kretschmar, G. R. Pallipparambil, and H. Fang. 2020. New pest response guidelines. Helicoverpa armigera (Hübner) (Old World bollworm). U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.

- Cook, J. C. 2020. New pest response guidelines. ‘Candidatus Phytoplasma prunorum’-Seemüller and Schneider (European stone fruit yellows). U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.

Hui Fang, PhD

Research Scholar

NSF Center for Integrated Pest Management

Educational Background

Ph.D., 2013, in Plant and Environmental Sciences, New Mexico State University, Las Cruces, NM

Dissertation: Mapping quantitative trait loci (QTL) for resistance to Verticillium wilt using a backcross inbred line and a recombinant inbred line population in cotton.

M.S., 2004, in Plant Pathology, Yunnan Agricultural University, Kunming, China

Thesis: Population structure of genetic diversity for rice blast control and its ecological mechanisms.

B.S., 1992, in Plant Protection, Yunnan Agricultural University, Kunming, China

Employment History

North Carolina State University, Center for Integrated Pest Management Raleigh, North Carolina

Research Scholar May 2018 - present

North Carolina State University, Dept. of Crop & Soil Sciences Raleigh, North Carolina

Research Specialist Dec. 2015 – May 2018

North Carolina State University, Dept. of Crop Science Raleigh, North Carolina

Post-Doctoral Research Associate July 2013 – Nov. 2015

New Mexico State University, Dept. of Plant & Environmental Sciences Las Cruces, New Mexico

Research Assistant / Teaching Assistant 2009 - 2013

Xishuangbanna Tropical Botanical Garden, the Chinese Academy of Sciences Kunming, China

Professional Services

Associate Editor, Euphytica (2022 - present)

Senior Editor, Plant Disease (2016 - 2018)

Have reviewed more than 30 papers for peer-reviewed journals including PLoS ONE, BMC Genomics, Plant Disease, Euphytica, Crop Science, Industrial Crops and Products, and Frontiers in Plant Science.

Selected Publications

Patent - Zhu, Y.Y., H.P. Zhou, L. Peng, Y.Y. Wang, H. Fang, X.H. He, Y Li, Z.S. Li, and H. Cai. 2006. Diversity konjaku and corn planting method capable of controlling soft rot of konjaku. Patent No.: ZL 200310110792.X.

Book chapters (Severed on editorial committee for two books)

1. Fang, H., et al. The Ecological Basis of Genetic Diversity for Crop Disease Control. In Zhu, Y.Y. ed. Genetic Diversity for Crops Diseases Sustainable Management. Science Press, Beijing, 2007.

2. Fang, H., et al. The Application Study on Optimization Colony Cultivation Pattern of Genetic Diversity for Crop Disease. In Zhu, Y.Y. ed. Genetic Diversity for Crops Diseases Sustainable Management. Science Press, Beijing, 2007.

3. Fang, H., et al. Demonstration and Extension on Technology of Genetic Diversity for Crop Disease Sustainable Control. In Zhu, Y.Y. ed. Genetic Diversity for Crops Diseases Sustainable Management. Science Press, Beijing, 2007.

Dr Weiqi Luo

2001 South Rock Road, Fort Pierce, FL 34945

Office: 772-462-5884 Cell: 772-924-4127

Weiqi.Luo@ars.usda.gov

Summary

With a B.Sc. in Mathematics and Applied Mathematics from the University of Shantou, China (2003), a M.Sc. in Data Analysis, Network and Nonlinear Dynamical System from the University of York, UK (2004), and a Ph.D. in Statistics from the University of Leeds, UK (2008), Dr. Luo has gained extensive knowledge& experience in applied mathematics and statistics, computer simulations & forecasting, dynamic system and high-dimensional data analysis, to study disease dispersal and mitigation on a multinational scale. He has worked several years as biostatistician at The Food and Environmental Research Agency (UK) before beginning research in Florida (2011) as collaborated senior research scholar in NCSU and visiting scientist in USDA, Fort Pierce. He played a key role in a wide range of multidisciplinary projects including, but not limited to, risk-based survey of HLB/ACP in FL, CA, TX and AZ, Plum Pox Virus (PPV) survey in NY and CA, Census travel modelling, agent-based disease simulation, GIS disease mapping and Aerial image processing. He is actively involved in the production of research papers and conference presentations, ensuring prompt communication of findings to a wide scientific and academic community. To this end, he has contributed to a number of publications (45 peer reviewed papers) and has given numbers of external presentations (48 Published conference Proceedings/abstracts) on various aspects of his modeling work. He has developed interactive front-end interfaces to share models, tools and other project outputs to general audiences in a user-friendly manner (https://agriskmodels.com). He is also a frequent reviewer for the Journal of Phytopathology, Journal of Plant Pathology, and the Journal of Horticultural Science and Biotechnology.

Major research activities (lead PI/Co-PI)

1. Risk-based models analyzing invasive and exotic pests/diseases of plants(primary focus), animals and humans

Combining risk variables with geographic information system (GIS) data, we designed surveys and maps for stakeholders, helping facilitate the appropriation of fiscal and human resources for careful and cost-effective sampling.

a. Citrus huanglongbing (HLB) and its vector, Asian citrus psyllid (ACP) risk-based models and surveys (statewide and high-intensive local) – CA, FL, TX, AZ

b. Plum pox virus (PPV) risk-based models and surveys – NY, CA

c. Statewide Multipest Survey – FL (multiple pests and specific for Citrus Black Spot (CBS))

2. Citrus Health Management Area (CHMA) construction and ACP monitoring – CA, FL

Optimized the placement of CHMA boundaries according to similarity in disease intensity and pest populations, grouping regions with similar situations together for pragmatic evaluation and treatment.

3. Spatially-explicit epidemiological models with early detection techniques (EDTs) and other control interventions

Demonstrated how to optimize plant disease intervention and management with simulations of plant pathogen spatial distribution. HLB/ACP models emphasizing:

a. Mixed landscapes of residential/commercial citrus (Agent-based model)

b. Optimizing survey design strategy with manpower and resource constraints (Survey Extension)

c. Long distance disease dispersal with extreme climate events (Hurricane mediated spread)

4. Census travel model for disease/pest introduction, with extensions to local transmission risk models

Developed web application to model the effect of international travel on disease epidemics to predict the most likely locations for pest/disease introduction. Employing a geospatial method, the model integrates both U.S. census and international travel data with the epidemiological characteristics of various pathosystems to show which regions are most at-risk to disease introduction. Epidemiological models are then coupled with the census travel model to further identify areas at-risk of local reproduction and dispersal, as well as how diseases interact with the landscape of agricultural and residential areas

a. Census travel model for disease introduction

b. Human mediated dispersal for local disease transmission

5. Utilization of GIS data to investigate host and disease interaction

a. Aerial image analysis of citrus canopy in Florida to identify HLB impact

b. Investigate effect of neighboring crops/landscape on disease risk (Biodiversity)

Online App development and maintenance:

Agriculture Risk models home page (https://agriskmodels.com/)

Census travel risk introduction model (https://epi-models.shinyapps.io/CTUI/)

ACP/HLB dynamics in real-world landscapes (https://epi-models.shinyapps.io/ABM_Demo/)

Risk-based survey resource allocation (https://epi-models.shinyapps.io/SurveyExtension/)

ASTA Phyto-risk assessment for seed qualify management (https://epi-models.shinyapps.io/PhytoRisk/)

Predicting long-distance disease dispersal risk from major hurricane (https://epi-models.shinyapps.io/Hurricane/)

Human movement disease transmission and Hurricane long-distance disease dispersal front-end (under-development)

CCTEA Field survey design assistance tool (under-development)

Select Recent Manuscripts Published

1. Armstrong, C.M., Zhou, L., Luo, W., Batuman, O., Alabi, O.J., & Duan, P. (2021) Identification of a chromosomal deletion mutation and the dynamics of two major populations of Candidatus Liberibacter asiaticus in its hosts. Phytopathology, 112:81-88, https://doi.org/10.1094/PHYTO-08-21-0325-FI.

2. Armstrong, C.M. Doud, M.S., Latza, C.L., Luo, W., Zhao, W., Plotto, A., Bai, J., Stover, E. & Duan, P. (2021) Beneficial horticultural traits derived from the application of solar thermotherapy to mature HLB-affected citrus trees. Horticultural Plant Journal, https://doi.org/10.1016/j.hpj.2021.04.008

3. Qian, M., Wang, L., Zhang, S., Sun, L., Luo, W., Posny, D., Xu, S., Tang, C., Ma, M., Zhang, C., Lin, S., Wang, J., Hui, W., Zhang, S. 2021. Investigation of proline in superficial scald development during low temperature storage of ‘Dangshansuli’ pear fruit. Postharvest Biology and Technology, 181,111643. https://doi.org/10.1016/j.postharvbio.2021.111643.

Lauren E. Quevillon

Morrisville, North Carolina

lauren.quevillon@gmail.com | (860) 208-003

SUMMARY

I am a broadly-trained pest and disease ecologist with a passion for synthesizing data to drive decision-making. In my current role as an analyst and project leader on academic-government collaborations, I have gained extensive experience in efficiently distilling information and developing data systems to guide U.S. plant biosecurity activities. I have a background in infectious disease modeling, data analysis, and experimental design, with experience and aptitude for communicating with a wide array of stakeholders.

EDUCATION

Pennsylvania State University 2012 - 2018

Eberly College of Science State College, PA

Ph.D. in Biology

Thesis: “The ecology, epidemiology, and evolution of parasites infecting ants (Hymenoptera: Formicidae)”

Thesis Advisor: Dr. David Hughes

Cornell University 2006 - 2010

College of Arts and Sciences Ithaca, NY

B.A. in Biological Sciences

PROFESSIONAL EXPERIENCE

North Carolina State University 2018 - present

NSF Center for Integrated Pest Management Raleigh, NC

Research Scholar, New Pest Response Guidelines (NPRG) project (Nov. 2021 – present)

Analyst and Co-PI, Objective Prioritization of Exotic Pests (OPEP) project (Jan. 2021 – present)

- Literature reviews: Became the in-house subject matter expert on a variety of taxonomically diverse plant pests (ranging from viruses to insects) by efficiently deep-diving through all available literature.

- Data consolidation and analysis: Evaluated data quality and consolidated evidence about pest biology, damage, potential impact, and effective mitigation strategies.

- Survey design: Consulted with statisticians and modelers to design pest detection and delimitation surveys and wrote survey instructions for deployment by federal and state surveyors.

- Synthesis and action: Synthesized information and wrote concise impact assessments and response guidelines. These assessments prioritized pests based on their predicted impact if introduced to the U.S. and provided survey and mitigation guidelines for use immediately following introductions, which facilitated the efficient use of USDA resources and funding.

• Team management: Coached new and veteran analysts on literature review techniques, evidence evaluation, and concise synthesis for stakeholders. Ensured project deliverables were met and facilitated communication between academic and government collaborators.

Analyst and Co-PI, Global Pest and Disease Database (GPDD) project (Nov. 2018 - Nov. 2021)

• Literature reviews: Conducted extensive literature reviews (searched/digested/analyzed 100+ papers per week) on hundreds of taxonomically diverse plant pests and pathogens. Evaluated data quality, and entered information on biology, host associations, impact, and management into a secure USDA database of 6,000+ pests of concern to U.S. agriculture.

• Data curation: Refined and implemented data capture and organization protocols based on feedback from USDA stakeholders and in consultation with developers.

• Quality control: Developed and implemented quality control protocols to ensure standardized data capture protocols and data quality across analysts.

• Team management: Managed a team of six analysts, allocated analyst resources based on dynamic project priorities, trained new analysts on data capture protocols, and facilitated intra- and inter-team communication and consensus-building.

SELECT PUBLICATIONS

Academic Publications

• Quevillon, L.E. and D.P. Hughes. 2018. Pathogens, parasites, and parasitoids of ants- a review and synthesis of host records and parasite biology. bioRxiv. doi: https://doi.org.10.1101/384495.

• Hughes, D.P., J.P.M. Araujo, R.G. Loreto, L.E. Quevillon, C. de Bekker, and H.C. Evans. 2016. From so simple a beginning: The evolution of behavioral manipulation by fungi. Advances in Genetics 9, 437-469.

• Quevillon, L.E., E.M. Hanks, S. Bansal, and D.P. Hughes. 2015. Social, spatial, and temporal organization in a complex insect society. Scientific Reports 5, 13393.

• Byers, J.E., A.J. Malek, L.E. Quevillon, I. Altman, and C.L. Keough. 2015. Opposing selective pressures decouple pattern and process of parasitic infection over small spatial scale. Oikos 124(11), 1511-1519.

• de Bekker, C., L.E. Quevillon, P.B. Smith, K.R. Fleming, D. Ghosh, and D.P. Hughes. 2014. Species-specific ant brain manipulation by a specialized fungal parasite. BMC Evolutionary Biology 14(1), 166

Government Publications

• Cook, J.C. and L.E. Quevillon. 2022. New Pest Response Guidelines. Hymenoscyphus fraxineus— Ash dieback. U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Washington, D.C.

• Quevillon, L.E., I. Pulakkatu-thodi, and J.C. Cook. 2022. New Pest Response Guidelines. Crocidosema aporema — Soybean bud borer. U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Washington, D.C.

- Cook, J.C., L.E. Quevillon, and J.B. van Kretschmar. 2022. New Pest Response Guidelines. Autographa gamma — Silver Y moth. U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Washington, D. C.

- Cook, J.C., L.E. Quevillon, and J.B. van Kretschmar. 2022. New Pest Response Guidelines. Tecia solanivora — Guatemalan potato tuber moth. U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Washington, D. C.

- Quevillon, L.E. 2022. Objective Prioritization of Exotic Pests (OPEP) Impact Assessment for Curculio elephas (Curculionidae): Chestnut weevil. United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine (PPQ), Raleigh, NC

- Quevillon, L.E. 2021. Objective Prioritization of Exotic Pests (OPEP) Impact Assessment for Alternaria jacinthicola (Pleosporaceae). United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine (PPQ), Raleigh, NC

- Quevillon, L.E. 2021. Objective Prioritization of Exotic Pests (OPEP) Impact Assessment for Arboridia kakogawana (Cicadellidae): Japanese grape leafhopper. United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine (PPQ), Raleigh, NC

Roger D. Magarey

Senior Researcher, Center for IPM

North Carolina State University

1730 Varsity Drive, Suite 110

Raleigh, NC, 27606

EDUCATION

1999. Ph.D. - Plant Pathology, Cornell University, New York, USA. Graduate Adviser: Dr. Robert Seem. Thesis project: A theoretical standard for the measurement of leaf surface wetness duration.

1989 Bachelor of Agricultural Science (Hons.) The University of Adelaide, Australia. Graduate adviser: Dr. Bryan Coombe. Thesis project: The effect of pre- and post-harvest fungicide sprays on the post-harvest physiology of pears.

PROFESSIONAL EXPERIENCE

2021- Co-Director of Southern IPM Center and Principal Researcher at Center for IPM.

2015-20 Senior Researcher, Plant Pathologist, NCSU Center for Integrated Pest Management (CIPM), NCSU. Research leader for the integrated Pest Information Platform (iPiPE). Development of predictive models for pest forecasting and risk analysis.

2003-14 Senior Researcher, Plant Pathologist, NCSU Center for Integrated Pest Management (CIPM), NCSU and cooperator at the Center for Plant Health Science and Technology, USDA-APHIS-PPQ.

2002-02 Extension Associate, Department of Plant Pathology, NCSU. Site-specific management of peanuts and weather-based pest risk assessment.

1994-99 Post-doctoral and Graduate Research Assistant, Department of Plant Pathology, Cornell University.

SELECTED PUBLICATIONS

Gottwald, T.R., E.L. Taylor, L. Amorim, A. Bergamin-Filho, R.B. Bassanezi, G.J. Silva, G. Fogliata, P.H. Fourie, J.H. Graham, V. Hattingh, A.B. Kriss, W. Luo, R.D. Magarey, G.C. Schutte, M.B. Spósito. 2021. Probabilistic risk-based model for the assessment of Phyllosticta citricarpa-infected citrus fruit and illicit plant material as pathways for pathogen introduction and establishment, Crop Protection142:105521.

Magarey, R.D., and Trexler, C.M. (2020) Information: a missing component in understanding and mitigating social epidemics. Humanities and Social Science Communications 7, 128. https://doi.org/10.1057/s41599-020-00620-w

Chappell, T. M., Magarey, R. D., Kurtz, R. W., Trexler, C. M., Pallipparambil, G. R., and Hain, E. F. (2019). Perspective: service-based business models to incentivize the efficient use of pesticides in crop protection. Pest Management Science, 75(11), 2865-2872. https://doi.org/10.1002/ps.5560

Magarey, R. D., Klammer, S. S., Chappell, T. M., Trexler, C. M., Pallipparambil, G. R., and Hain, E. F. (2019). Eco-efficiency as a strategy for optimizing the sustainability of pest management. Pest Management Science, 75(12), 3129-3134. https://doi.org/10.1002/ps.5560

Magarey, R.D., Chappell, T.M., Trexler, C.M., Pallipparambil, G.R. and Ernie F Hain, (2019). Social Ecological System Tools for Improving Crop Pest Management, Journal of Integrated Pest Management, 10:2 https://doi.org/10.1093/jipm/pmz004

Magarey, R., Newton, L., Hong, S.C., Takeuchi, Y., Christie, D., Jarnevich, C.S., Kohl, L., Damus, M., Higgins, S.I., Millar, L. and Castro, K., (2018). Comparison of four modeling tools for the prediction of potential distribution for non-indigenous weeds in the United States. Biological Invasions 20: 679-694.

Donatelli, M., Magarey, R. D., Bregaglio, S., Willocquet, L., Whish, J. P. M., and Savary, S. (2017). Modelling the impacts of pests and diseases on agricultural systems. Agricultural Systems. 155:215-224

Magarey, R.D. and Isard, S.A. (2017). A troubleshooting guide for mechanistic plant pest forecast models. Journal of Integrated Pest Management 8:3

Yulu Xia

Business Address: 1730 Varsity Dr. Suite 110, NCSU Centennial Campus
Raleigh, NC 27606, USA

Telephone: (919) 513-8187 (office), (919) 523-8801 (mobile)

Fax: (919) 513-1114

E-mail: yuluxia@ncsu.edu

Position & Affiliation: Interim Co-Director/Principal Research Scholar
NSF Center for Integrated Pest Management (CIPM)
North Carolina State University

EDUCATION

Ph.D. 1996 Entomology
Clemson University, Clemson, SC

Thesis: “Toxicity of natural and synthetic sugar esters against tobacco insects with an emphasis on the tobacco aphid, Myzus nictianae Blackman, (Homoptera: Aphididae)”.

Thesis advisers: Drs. Albert Johnson and Joe Culin

M.S. 1986 Entomology/Integrated Pest Management

South China Agricultural University / Guangdong Entomological Institute, Guangzhou, China

Thesis: “Studies on the ecology of two s predacious phytoseiid mites and their prey – citrus red mite”

Thesis advisers: Professor Mingdu HUANG and Dr. Shi-jun MA

M.S. 2001 Computer Networking
North Carolina State University, Raleigh, NC

SPECIALIZATION AND AREAS OF INTEREST

Research My research focuses on two areas: 1) generating scientific knowledge for preventing the economically significant agricultural pests and pathogens from the introduction and establishment in U.S., 2) developing methods and tools for pest survey, eradication, and management of invasive pests and diseases. Through the study of invasive pest distribution, biology, ecology, and pest management, my research contributed critical scientific information and knowledge to U.S. regulatory agency and growers in safeguarding U.S. agriculture. Field studies conducted overseas provided U.S. growers and regulatory staff with knowledge on management of these significant invasive agricultural pests and diseases such as fruit flies and citrus greening (huanglongbing).

SCHOLARLY AND CREATIVE RESEARCH ACTIVITIES

1. GRANTS, CONTRACTS, AND SUPPORT Total $18.3 million

2. RESEARCH OUTPUT Publications – a total 106 publications, refer to the document of Publication List

3. ACADEMIC ACTIVITIES

1. Selected Grant Review Panels

2015 USAID IPM Innovation Lab

2012 Citrus Research and Development Foundation (Florida)

2011 The United States Department of Agriculture, Small Business Innovation Research (SBIR) program

2008 The United States - Israel Binational Agricultural Research & Development Fund

2008 Cyber-Enabled discovery and Innovation (CDI), Type II, The National Science Foundation

2007 The United States - Israel Binational Agricultural Research & Development Fund

2. Selected Peer Reviews

2020 Journal of Insect Science

2020 Crop Protection

2019 International Journal of Pest Management

2018 Ecological Modeling

2017 Ecological Modeling

2014 Computers and Electronics in Agriculture
2012 Computers and Electronics in Agriculture

2009 Pest Management Science

2009 Computers and Electronics in Agriculture

3. Recent Session Chair/Organizer of International Scientific Conferences & Meetings

2017 Session 9 - Preventing and Managing Risks of Exotic Fruit Flies of Economic Significance. The 3rd International Congress on Biological Invasions, Hangzhou, China

2010 Huanglongbing and the Asian Citrus Psyllid Research and Outreach – Bring US and Chinese Scientists together. 2nd International HLB Meeting, Fujian Academy of Agricultural Science. Fuzhou, China

JACOB BANT (JAAP) VAN KRETSCHMAR

Raleigh, NC 984-895-0007 jaap.vankretschmar@usda.gov jbkretsc@ncsu.edu

Research Scholar with North Carolina State University Center for Integrated Pest Management. Principal Investigator for NCSU CIPM/USDA-APHIS-PPQ and CIPM/US AID projects. Coordinate and provide analysis for agricultural plant-pest projects.

EDUCATION

Ph.D., North Carolina State University, Raleigh, NC, 2010 (Major: Entomology; Minor: Biotechnology)

Master of Science, NCSU, Raleigh, NC, 1995 (Major: Soil Science; Minor: Statistics)

Bachelor of Science, Purdue University, West Lafayette, IN, 1985 (Major: Agronomy)

PROFESSIONAL EXPERIENCE

North Carolina State University – Center for Integrated Pest Management

Raleigh, NC

August 2013–Present

● ANALYST, USDA-APHIS-PPQ Exotic Plant Pest Monitoring (“PestLens” database and web application) 2021-Present

● PRINCIPAL INVESTIGATOR, USDA-APHIS-PPQ Exotic Plant Pest Monitoring (“PestLens” database and web application) 2019-2021

• PRINCIPAL INVESTIGATOR, US AID/VA Tech IIL (IPM Innovations Lab) East Africa Groundnut leafminer project, 2017-2021

● RESEARCH SCHOLAR, USDA-APHIS New Pest Response Guidelines (NPRGs), 2014 – 2021

● PRINCIPAL INVESTIGATOR, USDA-APHIS-PPQ NAPPRA (Not Approved Pending Pest Risk Analysis) import-prohibition pest datasheets project, 2014-2020

● POSTDOCTORAL RESEARCH ASSOCIATE, USDA-APHIS NPRGs, 2013-2014

North Carolina State University – Department of Entomology

Raleigh, NC March 2004–August 2013

● POSTDOCTORAL RESEARCH ASSOCIATE, October 2010–July 2013

● RESEARCH ASSISTANT, May 2010–September 2010

● GRADUATE RESEARCH & TEACHING ASSISTANT, July 2006–May 2010

● RESEARCH TECHNICIAN, March 2004–July 2006

Bayer CropScience – Department of Residues: Soil and Water

Research Triangle Park, NC October 2003–March 2004

● CONTRACT WRITER, October 2003–March 2004

Bayer CropScience (formerly Aventis CropScience, formerly Rhône-Poulenc Ag Co.)

Research Triangle Park, NC July 1991 – October 2003

● RESEARCH SCIENTIST (STUDY DIRECTOR & PRINCIPAL ANALYTICAL INVESTIGATOR), January 2001–October 2003

● RESEARCH SCIENTIST (STUDY DIRECTOR), January 2000–January 2001

● ASSOCIATE RESEARCH SCIENTIST, May 1999–January 2000

● SCIENTIST, December 1995-May 1999

● RESEARCH ASSISTANT, July 1991-December 1995

North Carolina State University – Crop Science Department

Raleigh, NC August 1988–May 1991

● GRADUATE RESEARCH ASSISTANT, August 1988 – May 1991

CIBA-GEIGY Agricultural Biotechnology Research Unit

Raleigh, NC April 1986–August 1988

● RESEARCH TECHNICIAN, April 1986–August 1988

PUBLICATIONS

Select Refereed Journal Articles

● Zhu, J., A. Dhammi, J.B. van Kretschmar, E.L. Vargo, C.S. Apperson, and R.M. Roe. 2017. Novel use of aliphatic n-methyl ketones as a fumigant and alternative to methyl bromide for insect control. Pest Management Science doi: 10.1002/ps.4749

● Dhammi, A., J.B. van Kretschmar, L. Ponnusamy, J.S. Bacheler, D.D. Reisig, A. Herbert, A. I. Del Pozo-Valdivia, and R.M. Roe. 2016. Biology, pest status, microbiome and control of kudzu bug (Hemiptera: Heteroptera: Plataspidae): A new invasive pest in the U.S. Int. J. of Mol. Sci. http://www.mdpi.com/1422-0067/17/9/1570/htm

● van Kretschmar, B., A. R. Cabrera, J. R. Bradley and R. M. Roe. 2013. Novel adult feeding disruption test (FDT) to detect insecticide resistance of lepidopteran pests in cotton. Pest Management Sci. 69:652-660

● van Kretschmar, J.B., W.D. Bailey, C. Arellano, G.D. Thompson, C.L. Sutula and R.M. Roe. 2011. Feeding disruption tests for monitoring the frequency of larval lepidopteran resistance to Cry1Ac, Cry1F, and Cry1Ab. Crop Protection 30: 863-870

● Magalhaes, L. C., J. B. van Kretschmar, K. V. Donohue and R. M. Roe. 2013. Pyrosequencing of the adult tarnished plant bug, Lygus lineolaris, and characterization of messages important in metabolism and development. Entomol. Exp. Appl. 146: 364–378

Recent USDA-APHIS-PPQ Technical Documents

● van Kretschmar, J.B. 2017. New Pest Response Guidelines. Cydalima perspectalis (Lepidoptera: Crambidae) (Walker, 1859) Box Tree Moth. U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.

- Cook, J.C. and J.B. van Kretschmar. 2017. New Pest Response Guidelines. 'Candidatus Phytoplasma phoenicium' Verdin et al. Almond Witches'-Broom. U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.

- Cook, J.C. and J.B. van Kretschmar. 2017. New Pest Response Guidelines. Cryptoblabes gnidiella (Lepidoptera: Pyralidae) (Millière, 1867). Christmas Berry Webworm. U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.

- Cook, J.C. and J.B. van Kretschmar. 2017. New Pest Response Guidelines. Eurygaster integriceps Puton (Hemiptera: Scutelleridae) Sunn Pest. U.S. Department of Agriculture, Animal Plant Health Inspection Service, Plant Protection and Quarantine, Government Printing Office, Washington, D.C.