



## Entomology and Vet School train future vets together

*By Michele Hatcher*

Bee health has been brought to the forefront of ecological concerns so UGA Entomology and the UGA Vet School joined forces to teach future vets how to do their part to keep bee populations safe and thriving.

Jennifer Berry, manager of the UGA Bee Lab, and Dr. Joerg Mayer, Associate Professor of Zoological Medicine at UGA's College of Veterinary Medicine, have teamed up to co-write the curriculum for an elective course for vet students which addresses critical bee health issues. This intensive 3-week course had its inaugural class this semester and was "very successful," Berry reported.

This all started when Mayer realized the need for the course after the Federal Drug Administration (FDA)

amended the Veterinary Feed Directive (VFD) requiring veterinarian prescriptions for antibiotic treatment of American and European Foulbrood, so he approached Berry and Keith Delaplane, entomology professor, about the idea of collaboratively developing a course.

Due to the regulatory changes, veterinarians and beekeepers found themselves in an interesting position. Beekeepers historically addressed this issue themselves by treating hives with antibiotics which now they could not access.

Veterinarians on the other hand, did not typically treat bees for, well, anything, or write prescriptions to treat insect diseases.

Beekeepers now need veterinarian medical knowledge, yet veterinarians must understand bees. The collaboration was essential.

"This bacterial disease – Foulbrood -- is highly contagious and can weaken an entire bee colony," Berry explained, so there was no time to waste for the state's beekeepers. Veterinarians needed to understand how to partner with beekeepers, large and small, to maintain healthy hives.

The hands-on course involved class work, beekeeping, tours and fieldwork.

"The students were extremely engaged and motivated to learn about bees and beekeeping since they may one day be asked to inspect a colony. Some of the students had beekeeping experience or their family members had kept bees at one point. And some were interested in becoming beekeepers themselves," Berry said, describing the initial class of 10.

The students will continue developing their skills through maintaining a beehive placed on the roof of the UGA Vet School on campus. Students will also have the opportunity to sit for the UGA Master Beekeeper certification exam and will be able to attend meetings with local beekeepers' associations.

Realizing the need to educate future vets concerning bee health and seeing the keen interest of the students, Berry and Mayer hope to see the class offered every semester soon. But for now, it will be taught at least once a year.

"We really enjoyed teaching this class! It was the first of its kind in the state of Georgia and is very important for the vet students to understand the critical role they may be asked to fill once they are a practicing veterinarian. I look forward to working with Dr. Mayer in the future and to further educating students about this amazing insect, the honey bee," Berry said.



## From the desk of S. Kristine Braman ...

This unprecedented time has presented numerous challenges for our UGA Entomology Department Faculty Staff and Students. It has, however, been inspiring to see our faculty quickly pivot to online instruction, develop and implement hybrid models and devise creative methods to teach their labs and engage in active and service learning in a remote environment. Equally inspiring has been watching our students reach out and support each other during this stressful time. Silver-linings abound. We are becoming experts in webinars and virtual field days to remain in touch with our clientele.



Our student numbers are up and we are celebrating student awards and a number of successful student defenses this semester.

Virtual SEB-ESA was a new experience for many. We appreciate all the effort that went in to making that event and our presentation options possible. We are very proud of one of our former students, **Gretchen Pettis**, as she delivered her outstanding keynote address. We also congratulate our graduate students, Tzu-Chin Liu, Subin Neupane and Kelly Tims for their success as first and second place winners in the student PhD ten-minute paper competition. We also appreciate the dedication of our

UGA Bug Dawgs competition team **Fawad Khan, Midhula Gireesh, Gurjit Singh, Kyle Slusher and Kelly Tims** and their coach extraordinaire **Dr. Nancy Hinkle** for their strong performance in a tough competition in the virtual Entomology Games. We are so proud of our faculty, staff and students that you will see highlighted in this issue. It is great to see your hard work recognized!

We welcome **Hannah Mosteller** to our department as an accountant in our main office. We also congratulate our faculty and staff who have retired this past year: **Dr. Karl Espelie, Jim Quick, Jenny Granberry,**

**Debbie Rutland and Nancy Jordan.** We celebrated years of service awards with **Dr. Dave Buntin-35 years, Dr. Keith Delaplane- 30 years and Dr. Dan Suiter- 20 years.**

We are so looking forward to a gradual resumption of our full face to face activities.

While we have been resilient and

mastered many new distance learning skills, we are all ready to leave the zoom room. **I hope we all enjoy a safe and productive summer season.**



### Inside this issue

Student Awards .....	18
Calendar reminders .....	19
Snapshots .....	15
Publications .....	7-14
New Face.....	3
Student Spotlights.....	4-6

### Special points of interest

- IPM Awards, page 17
- New Twitter info, page 18
- Book Review, page 13

## In other news

Several entomology students have been awarded scholarships in the last few months. The department is very proud of their achievements. The scholarships and the students selected are as follows:

The **Herbert H. Ross Memorial Scholarships** were awarded to **Joshua Washington, Pin-Chu Lai, Jean Liu** and **Fawad Khan**.

The **Horace Odin Lund Entomology Scholarships** were awarded to **Alejandra Monterrosa** and **Gabriela Cardona-Rivera**.

The **R. Barclay McGhee Scholarship in Parasitology** was awarded to **Sophie Racey**.

The **Sparks Award for Outstanding Achievement in Research** was awarded to **Joseph Taylor** and **Kelsey Coffman**. The **Sparks Award for Outstanding Achievement in Outreach** was awarded to **Nia Myers** and **Daniel O'Connell**.

**Amy Janvier** was selected for the Outstanding Teaching Assistant Award by the University of Georgia.



Amy Janvier

The Pest Management Foundation recently awarded five \$2000 scholarships to university students nationwide who are pursuing advanced degrees in entomology. UGA Entomology Ph.D. student **Allison Johnson** was selected as one of this year's recipients. The scholarship has been awarded to students interested in urban entomology since 2018. Allison is working under the direction of Dr. Brian Forschler, principle investigator for the Household and Structural Entomology Research Program at UGA.



Allison Johnson

**New CAES Ambassadors** from our department are **Amaja Andrews, Aynslee Conner, Ashley Dombrowski, Taylor Pearson** and **Douglas Vines**. **CONGRATULATIONS!**

## NEW FACE IN THE DEPARTMENT



**Hannah Mosteller** recently joined the Athens office staff as an accountant for the department. Although originally from a small town near Charlotte, North Carolina, she comes to us from Tuscaloosa, Alabama. Hannah spent five years in Tuscaloosa and while there worked in Procurement Services at the University of Alabama for three and a half years before coming to UGA. She received her education from Liberty University where she earned a Bachelor of Science in Paralegal Studies (2016), a Juris Master's in International Legal Studies (2017), a Master of Business Administration (2020) and a Graduate Certificate in Management and Leadership (2021).

In her free time, Hannah enjoys playing with her two dogs, Rosie and Sasha. She also enjoys attending college sporting events, especially football and baseball and is especially looking forward to attending a UGA football game this year! Go Dawgs!

ing forward to attending a UGA football game this year! Go Dawgs!

Welcome, Hannah! We hope you feel right at home in UGA Entomology!

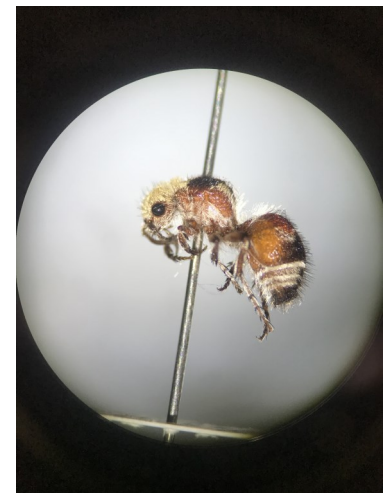
## Undergraduate Student Spotlight

### Sarah Yount

I am currently a fourth year Entomology major living and working in Washington, DC for my last semester as an undergraduate. I transferred to the University of Georgia in the Spring of 2019 and began coursework to pursue a career in physical therapy. Not long after my transfer, I reconnected with Dr. Marianne Shockley, who I had known since the fifth grade when I attended the University of Georgia bug camp. She re-kindled my passion for learning about insects and I knew I wanted to change my major to Entomology. I immediately began gaining work experience at various UGA locations. For the summer of 2019, I was scheduled to participate in my first study abroad, the entomology trip to the Galapagos Islands. This plan fell through, and I interned in Dr. Kenneth Ross's Fire Ant lab doing research on fire ant queens through the Center for Undergraduate Research Opportunities (CURO). For the fall of 2019 I worked in Dr. Joseph McHugh's Coleoptera lab and the Georgia Museum of Natural History learning curatorial skills. In the spring of 2020 I was a participant of the Washington Semester Program (WSP) through UGA and moved to Washington, DC. For the duration of my time in DC, I in-



terned for the Walter Reed Biosystematics Unit and the Smithsonian Institution: National Museum of Natural History. I learned about how to digitize specimens, make risk-characterization maps, and curate and identify Hymenoptera specimens. It was during this experience that I decided I was most interested in studying insects and how they relate medically to humans. I wanted to combine my love for studying insects and my desire to help improve the human condition. After I was sent home due to COVID-19, I continued both internships through the summer and proceeded to fail my first class, organic chemistry. I think it is important to include this fact to encourage younger students that it is not the end of the world to fail a class. For the end of the fall of 2020 semester, I worked in Dr. Donald Champagne's lab extracting the salivary glands from mosquitos. During the month of December, I decided to move back to DC to participate in the WSP for a second time for the spring 2021 semester. This time, I interned solely for



the Smithsonian Institution: NMNH and began aggressively networking and looking for positions for after graduation. My current plans for the future are to fully move to DC to work for the National Institute of Health for a year, after which I hope to attend Cornell University to earn a PhD in Medical Entomology. The main lessons I have learned in this field are first, to never stop making connections, second, never burn bridges, and third, remember GPA is not everything. I had so much help along the way but I would especially like to thank Dr. Kenneth Ross, Dr. Joseph McHugh, Dr. Donald Champagne, Devin Duggan, Takao Sasaki, and Don DeMaria for their support.



# Alejandra Monterrosa

As far back as I can remember science has always been my strongest and most favorite subject in school. So naturally, going into college it was an easy choice to make my major general biology at Gordon State College. At that point in my life I knew that biology was definitely the way to go, although I was not sure what direction to take with it. I had contemplated going into marine biology or maybe even psychology, but it wasn't until I was about to graduate that I had my first experience with entomology. One of my professors asked me if I would be interested in a seasonal position at the UGA Griffin campus in Dr. Shimat Joseph's entomology lab. I had absolutely no idea of what science field to go into, but I figured lab experience would be a must when I did decide the field! I went in for an interview and the next thing I knew I'm helping feed and measure fall army worms and working with eriophyid mites and rose rosette disease. As I worked with all the different insects and people in the lab, I found myself really enjoying the field. I graduated with my bachelors just to find myself right back in school going for a masters in entomology.

Soon after beginning my coursework I started studying ambrosia beetles and their phenology across Georgia as well as across different commodities. My research goals are to help refine monitoring and management practices to help keep these pests from infesting nurseries and orchards.

The whole experience in this field has been amazing when it comes to the things that I've learned and especially all of the people I've gotten to meet along the way. These courses and this field introduced me to an area in science that I never considered to try until the opportunity presented itself. One thing I especially love about this field is that it gave me a new hobby, thanks to Dr. McHugh's insect taxonomy class teaching me how to pin and display insects! I will forever cherish all of the memories and experiences I've gotten in this field with all of the people I've gotten to meet. As graduation gets closer, I've considered several options for what comes next, but I have finally decided that I plan on taking a break from continuing school for the moment. It has always been a dream of mine to leave home and go and travel, so after graduation I intend to buy a van and converting it into a home on wheels so that I can live out that dream and see where it takes me! Although I have to admit, my interest in marine biology came back abruptly when I just recently learned that we aren't sure how eels reproduce (which I find to be crazy), so maybe I'll travel and go pursue that field next. Anything is possible!



### Fawad Khan

As a growing child in Pakistan, I never imagined working with insects in my life. However, I have some childhood memories of encountering insects,



like ants, butterflies, honey bees, and lady beetles. As a subject, I developed an interest in Entomology during the second year of college when I took introductory entomology

courses. After taking Entomology as a major, I enjoyed the next couple of years as an undergraduate student. In the last semester of my undergraduate degree, I joined the Institute for Agriculture & Biology for a mandatory internship. I worked in Dr. NA Saeed's Lab, where my work focused on rearing *Spodoptera litura* and *Helicoverpa armigera*, comparing *Myzus persicae* infestation on different tomato varieties, observing the mass production of *Trichogramma* sp. and *Chrysoperla carnea*. After this training, I graduated with the highest distinction from Entomology Dept., College of Agriculture, Multan Pakistan. Soon after my undergraduate degree, in 2011, I got a master's scholarship to study at the University of Agriculture, Faisalabad, Pakistan. During master's, I worked in a stored product entomology lab with Dr. M Saghier & Dr. MU Hasan, and my research focused on using botanical extracts to manage *Tribolium castaneum* infestations in stored products. I successfully published research papers and extension publications associated with the stored grain pests.

In 2013, I got an opportunity to work as a visiting lecturer at a newborn Entomology Dept. in Layyah, Pakistan. My responsibilities included teaching and Ento-

mology lab development. In 2015, I joined Dr. S Saeed's Lab as a Research Assistant and worked on fruit flies. Later, in 2016, I was appointed as a non-tenured faculty at the University of Agriculture, Multan, Pakistan. It was also a newly established institute with great challenges and opportunities. In the fourth year of my professional career, I realized the need for better academic and research training. This passion led me to apply for multiple scholarships.

In 2018, I won the Fulbright scholarship to study in the US. It was tough to resign near my tenure and leave my family, but I took this leap for better training! I am currently working in Dr. SV Joseph's Lab, and my work involves estimating predation using different techniques, including clay models. See my recently published article at: <https://onlinelibrary.wiley.com/doi/abs/10.1111/eea.13000> Also, I am working to understand the effects of abiotic stresses on *Spodoptera frugiperda* and *Orius insidiosus*. My research is a mix of lab and fieldwork. I enjoyed working in the sod farms and the residential lawns for my research. After my Ph.D., I would return to my home country, Pakistan, and serve as a university faculty.

Entomology has a role in my family life too. My better half, Tahira, is also an Entomologist and a university faculty in Pakistan. We have two amazing daughters: Hairum, 6-years, and Zainab, 3-years old – both like bugs. I enjoy virtually connecting with family, mentoring scholarship aspirants, and volunteering during my free time.

UGA Entomology Department offered me a great learning environment. I found wonderful friends and great mentors during this period. The journey is beautiful so far, and it continues!



# Publications 2020

- Acebes-Doria, A. L., & Halliday, P. L. (2020). Insecticide Efficacy Against Pecan Aphids and Pecan Leaf Scorch Mites, 2018. *Arthropod Management Tests*, 45(1). doi:[10.1093/amt/tsaa087](https://doi.org/10.1093/amt/tsaa087)
- Acebes-Doria, A. L., Agnello, A. M., Alston, D. G., Andrews, H., Beers, E. H., Bergh, J. C., . . . Leskey, T. C. (2020). Season-Long Monitoring of the Brown Marmorated Stink Bug (Hemiptera: Pentatomidae) Throughout the United States Using Commercially Available Traps and Lures. *JOURNAL OF ECONOMIC ENTOMOLOGY*, 113(1), 159-171. doi:[10.1093/jee/toz240](https://doi.org/10.1093/jee/toz240)
- Aldebron, C., Jones, M. S., Snyder, W. E., & Blubaugh, C. K. (2020). Soil organic matter links organic farming to enhanced predator evenness. *BIOLOGICAL CONTROL*, 146, 8 pages. doi:[10.1016/j.biocontrol.2020.104278](https://doi.org/10.1016/j.biocontrol.2020.104278)
- Andreason, S. A., Shelby, E. A., Moss, J. B., Moore, P. J., Moore, A. J., & Simmons, A. M. (2020). Whitefly Endosymbionts: Biology, Evolution, and Plant Virus Interactions. *INSECTS*, 11(11), 19 pages. doi:[10.3390/insects11110775](https://doi.org/10.3390/insects11110775)
- Arsenault, S., King, J. T., Kay, S., Lacy, K. D., Ross, K. G., & Hunt, B. G. (2020). Simple inheritance, complex regulation: Supergene-mediated fire ant queen polymorphism. *MOLECULAR ECOLOGY*, 29(19), 3622-3636. doi:[10.1111/mec.15581](https://doi.org/10.1111/mec.15581)
- Bartlett, L. J., Boots, M., Brosi, B. J., de Roode, J. C., Delaplane, K. S., Hernandez, C. A., & Wilfert, L. (2021). Persistent effects of management history on honeybee colony virus abundances. *J Invertebr Pathol*, 179, 107520. doi:[10.1016/j.jip.2020.107520](https://doi.org/10.1016/j.jip.2020.107520)
- Batzer, D. P., & Wu, H. (2020). Ecology of Terrestrial Arthropods in Freshwater Wetlands. *ANNUAL REVIEW OF ENTOMOLOGY*, VOL 65, 65, 101-119. doi:[10.1146/annurev-ento-011019-024902](https://doi.org/10.1146/annurev-ento-011019-024902)
- Batzer, D. P., Mehmood, A., Mead, D. G., & Champagne, D. E. (2020). Phenology of *Coquillettia perturbans* and *Culiseta melanura* (Diptera: Culicidae) in East-Central Georgia, USA: Implications for the Ecology of Eastern Equine Encephalitis Virus. *JOURNAL OF ENTOMOLOGICAL SCIENCE*, 55(2), 156-162. doi:[10.18474/0749-8004-55.2.156](https://doi.org/10.18474/0749-8004-55.2.156)
- Braman, S. K., & Westerfield, B. (2020). Influence of Trap Crops on Tomato and Squash Insect Pests. *JOURNAL OF ENTOMOLOGICAL SCIENCE*, 55(4), 578-583. doi:[10.18474/0749-8004-55.4.578](https://doi.org/10.18474/0749-8004-55.4.578)
- Bock, C. H., Rains, G. C., Hotchkiss, M. W., Chen, C., & Brannen, P. M. (2020). The Effect of Tractor Speed and Canopy Position on Fungicide Spray Deposition and Peach Scab Incidence and Severity. *PLANT DISEASE*, 104(7), 2014-2022. doi:[10.1094/PDIS-10-19-2225-RE](https://doi.org/10.1094/PDIS-10-19-2225-RE)
- Bostick, N. M., LaForest, J. H., Barger, C. T., Culbreath, A. K., Brenneman, T. B., Schmidt, J. M., . . . Toews, M. D. (2020). Assessment of Consensus-Based Scouting for Management of Sugarcane Aphid (Heteroptera: Aphididae) in Georgia. *JOURNAL OF ENTOMOLOGICAL SCIENCE*, 55(1), 1-13. doi:[10.18474/0749-8004-55.1.1](https://doi.org/10.18474/0749-8004-55.1.1)
- Bowers, C., Toews, M., Liu, Y., & Schmidt, J. M. (2020). Cover crops improve early season natural enemy recruitment and pest management in cotton production. *Biological Control*, 141, 104149. doi:[10.1016/j.biocontrol.2019.104149](https://doi.org/10.1016/j.biocontrol.2019.104149)
- Bush, B. M., Ulyshen, M. D., & Batzer, D. P. (2020). Effects of Chinese privet (*Ligustrum sinense*) invasion on decomposition and litter-dwelling invertebrates in Southeastern US floodplain forests. *BIOLOGICAL INVASIONS*, 22(6), 1957-1965. doi:[10.1007/s10530-020-02228-2](https://doi.org/10.1007/s10530-020-02228-2)
- Byrd, S., Snider, J., Grey, T., Culpepper, S., Whitaker, J., Roberts, P., . . . Collins, G. (2020). Chlorophylla Fluorescence Parameters do not Detect Yield-limiting Injury from Sub-lethal Rates of 2,4-Dichlorophenoxyacetic Acid (2,4-D) in Cotton (*Gossypium hirsutum*). *Journal of Experimental Agriculture International*, 42(1), 34-48. doi:[10.9734/JEAI/2020/v42i130449](https://doi.org/10.9734/JEAI/2020/v42i130449)
- Cave, R. D., Clarke, D., Ferro, M. L., MacRae, T., & McHugh, J. (2020). Thanks to Our 2019 Reviewers. *The Coleopterists Bulletin*, 74(1), 36. doi:[10.1649/0010-065x-74.1.36](https://doi.org/10.1649/0010-065x-74.1.36)

# Publications 2020

- Chappell, T. M., Ward, R., DePolt, K. T., Roberts, P. M., Greene, J. K., & Kennedy, G. G. (2020). Cotton thrips infestation predictor: a practical tool for predicting tobacco thrips (*Frankliniella fusca*) infestation of cotton seedlings in the south-eastern United States. *PEST MANAGEMENT SCIENCE*, 76(12), 4018-4028. doi:[10.1002/ps.5954](https://doi.org/10.1002/ps.5954)
- Coffman, K. A., & Burke, G. R. (2020). Genomic analysis reveals an exogenous viral symbiont with dual functionality in parasitoid wasps and their hosts. *PLOS PATHOGENS*, 16(11), 25 pages. doi:[10.1371/journal.ppat.1009069](https://doi.org/10.1371/journal.ppat.1009069)
- Coffman, K. A., Harrell, T. C., & Burke, G. R. (2020). A Mutualistic Poxvirus Exhibits Convergent Evolution with Other Heritable Viruses in Parasitoid Wasps. *JOURNAL OF VIROLOGY*, 94(8), 18 pages. doi:[10.1128/JVI.02059-19](https://doi.org/10.1128/JVI.02059-19)
- Coon, K. L., Valzania, L., Brown, M. R., & Strand, M. R. (2020). Predaceous Toxorhynchites mosquitoes require a living gut microbiota to develop. *PROCEEDINGS OF THE ROYAL SOCIETY B-BIOLOGICAL SCIENCES*, 287(1919), 9 pages. doi:[10.1098/rspb.2019.2705](https://doi.org/10.1098/rspb.2019.2705)
- Crossley, M. S., & Snyder, W. E. (2020). What Is the Spatial Extent of a Bemisia tabaci Population?. *INSECTS*, 11(11), 14 pages. doi:[10.3390/insects11110813](https://doi.org/10.3390/insects11110813)
- Crossley, M. S., Snyder, W. E., & Hardy, N. B. (2020). Insect-plant relationships predict the speed of insecticide adaptation. *EVOLUTIONARY APPLICATIONS*, 7 pages. doi:[10.1111/eva.13089](https://doi.org/10.1111/eva.13089)
- Crossley, M. S., Meier, A. R., Baldwin, E. M., Berry, L. L., Crenshaw, L. C., Hartman, G. L., . . . Moran, M. D. (2020). No net insect abundance and diversity declines across US Long Term Ecological Research sites. *NATURE ECOLOGY & EVOLUTION*, 4(10), 1368-+. doi:[10.1038/s41559-020-1269-4](https://doi.org/10.1038/s41559-020-1269-4)
- Disi, J., Williams, Z., & Sial, A. A. (2020). Evaluation of Best Use Practices for Spear-T in Season-Long Control Programs for Spotted-Wing Drosophila Adults in Georgia Blueberries, 2020. *Arthropod Management Tests*, 45(1). doi:[10.1093/amt/tsaa109](https://doi.org/10.1093/amt/tsaa109)
- Disi, J. O., Barnes, T., & Sial, A. A. (2020). Performance of Acramite 4SC on Southern Red Mite in Highbush Blueberry in Georgia, 2020. *Arthropod Management Tests*, 45(1). doi:[10.1093/amt/tsaa097](https://doi.org/10.1093/amt/tsaa097)
- Disi, J. O., Van Timmeren, S., Gress, B., Zalom, F., Isaacs, R., & Sial, A. (2020). Insecticide residue longevity for on-site screening of *Drosophila suzukii* (Matsumura) resistance. *PEST MANAGEMENT SCIENCE*, 76(9), 2918-2924. doi:[10.1002/ps.5880](https://doi.org/10.1002/ps.5880)
- Dorman, S. J., Gross, A. D., Musser, F. R., Catchot, B. D., Smith, R. H., Reisig, D. D., . . . Taylor, S. (2020). Resistance monitoring to four insecticides and mechanisms of resistance in *Lygus lineolaris* Palisot de Beauvois (Hemiptera: Miridae) populations of southeastern USA cotton. *PEST MANAGEMENT SCIENCE*, 76(12), 3935-3944. doi:[10.1002/ps.5940](https://doi.org/10.1002/ps.5940)
- Fu, Z., Li, Y., Elling, A. A., & Snyder, W. E. (2020). A draft genome of a field-collected *Steinernema feltiae* strain NW. *JOURNAL OF NEMATOLOGY*, 52, 7 pages. doi:[10.21307/jofnem-2020-003](https://doi.org/10.21307/jofnem-2020-003)
- Fu, Z., Meier, A. R., Epstein, B., Bergland, A. O., Castillo Carrillo, C. I., Cooper, W. R., . . . Snyder, W. E. (2020). Host plants and *Wolbachia* shape the population genetics of sympatric herbivore populations. *EVOLUTIONARY APPLICATIONS*, 13(10), 2740-2753. doi:[10.1111/eva.13079](https://doi.org/10.1111/eva.13079)
- Fue, K., Porter, W., Barnes, E., Li, C., & Rains, G. (2020). Autonomous Navigation of a Center-Articulated and Hydrostatic Transmission Rover using a Modified Pure Pursuit Algorithm in a Cotton Field. *SENSORS*, 20(16), 21 pages. doi:[10.3390/s20164412](https://doi.org/10.3390/s20164412)
- Fue, K., Porter, W., Barnes, E., Li, C., & Rains, G. (2020). Evaluation of a Stereo Vision System for Cotton Row Detection and Boll Location Estimation in Direct Sunlight. *AGRONOMY-BASEL*, 10(8), 21 pages. doi:[10.3390/agronomy10081137](https://doi.org/10.3390/agronomy10081137)
- Fue, K., Porter, W., Barnes, E., Li, C., & Rains, G. (2020). Center-Articulated Hydrostatic Cotton Harvesting Rover Using Visual-Servoing Control and a Finite State Machine. *ELECTRONICS*, 9(8), 21 pages. doi:[10.3390/electronics9081226](https://doi.org/10.3390/electronics9081226)



# Publications 2020

- Gadhve, K. R., Gautam, S., Rasmussen, D. A., & Srinivasan, R. (2020). Aphid Transmission of Potyvirus: The Largest Plant-Infecting RNA Virus Genus. *VIRUSES-BASEL*, 12(7), 22 pages. doi:[10.3390/v12070773](https://doi.org/10.3390/v12070773)
- Gadhve, K. R., Gautam, S., Dutta, B., Coolong, T., Adkins, S., & Srinivasan, R. (2020). Low Frequency of Horizontal and Vertical Transmission of Cucurbit Leaf Crumple Virus in Whitefly Bemisia tabaci Gennadius. *PHYTOPATHOLOGY*, 110(6), 1235-1241. doi:[10.1094/PHYTO-09-19-0337-R](https://doi.org/10.1094/PHYTO-09-19-0337-R)
- Gautam, S., Crossley, M. S., Dutta, B., Coolong, T., Simmons, A. M., da Silva, A., . . . Srinivasan, R. (2020). Low Genetic Variability in Bemisia tabaci MEAM1 Populations within Farmscapes of Georgia, USA. *INSECTS*, 11(12), 21 pages. doi:[10.3390/insects11120834](https://doi.org/10.3390/insects11120834)
- Gautam, S., Mugerwa, H., Sundaraj, S., Gadhve, K. R., Murphy, J. F., Dutta, B., & Srinivasan, R. (2020). Specific and Spillover Effects on Vectors Following Infection of Two RNA Viruses in Pepper Plants. *INSECTS*, 11(9), 15 pages. doi:[10.3390/insects11090602](https://doi.org/10.3390/insects11090602)
- Gautam, S., Gadhve, K. R., Buck, J. W., Dutta, B., Coolong, T., Adkins, S., & Srinivasan, R. (2020). Virus-virus interactions in a plant host and in a hemipteran vector: Implications for vector fitness and virus epidemics. *VIRUS RESEARCH*, 286, 13 pages. doi:[10.1016/j.virusres.2020.198069](https://doi.org/10.1016/j.virusres.2020.198069)
- Gilbert, A. J., Cline, A. R., Arias-Bohart, E. T., McHugh, J. V., Hartley, C., Smith, N. J., . . . Andrews, J. (2020). Fred Gordon Andrews (November 15, 1933 to April 16, 2019): In Memoriam. *PAN-PACIFIC ENTOMOLOGIST*, 96(3), 111-127. doi:[10.3956/2020-96.3.111](https://doi.org/10.3956/2020-96.3.111)
- Gireesh, M., & Joseph, S. V. (2021). Surface Movement of Billbugs (Coleoptera: Curculionidae) in Harvested and Non-harvested Sod.. *J Econ Entomol*, 114(1), 231-237. doi:[10.1093/jee/toaa277](https://doi.org/10.1093/jee/toaa277)
- Gireesh, M., & Joseph, S. (2020). Seasonal Occurrence and Abundance of Billbugs (Coleoptera: Curculionidae) in Georgia Sod Farms. *JOURNAL OF ECONOMIC ENTOMOLOGY*, 113(5), 2319-2327. doi:[10.1093/jee/toaa133](https://doi.org/10.1093/jee/toaa133)
- Gutierrez Illan, J., Bloom, E. H., Wohleb, C. H., Wenninger, E. J., Rondon, S. I., Jensen, A. S., . . . Crowder, D. W. (2020). Landscape structure and climate drive population dynamics of an insect vector within intensely managed agroecosystems. *ECOLOGICAL APPLICATIONS*, 30(5), 13 pages. doi:[10.1002/eap.2109](https://doi.org/10.1002/eap.2109)
- Higashi, C. H. V., Barton, B. T., & Oliver, K. M. (2020). Warmer nights offer no respite for a defensive mutualism. *JOURNAL OF ANIMAL ECOLOGY*, 89(8), 1895-1905. doi:[10.1111/1365-2656.13238](https://doi.org/10.1111/1365-2656.13238)
- Hounkpati, K., McHugh, J. V., Niang, A. A., & Goergen, G. (2020). Documenting museum records of West African Coccinellidae (Coleoptera) in Benin and Senegal. *BIODIVERSITY DATA JOURNAL*, 8, 42 pages. doi:[10.3897/BDJ.8.e47340](https://doi.org/10.3897/BDJ.8.e47340)
- Hunt, B. G. (2020). Supergene Evolution: Recombination Finds a Way. *CURRENT BIOLOGY*, 30(2), R73-R76. doi:[10.1016/j.cub.2019.12.006](https://doi.org/10.1016/j.cub.2019.12.006)
- Ives, A. R., Barton, B. T., Penczykowski, R. M., Harmon, J. P., Kim, K. L., Oliver, K., & Radeloff, V. C. (2020). Self-perpetuating ecological-evolutionary dynamics in an agricultural host-parasite system. *NATURE ECOLOGY & EVOLUTION*, 4(5), 20 pages. doi:[10.1038/s41559-020-1155-0](https://doi.org/10.1038/s41559-020-1155-0)
- Jiang, Y., Snider, J. L., Li, C., Rains, G. C., & Paterson, A. H. (2020). Ground Based Hyperspectral Imaging to Characterize Canopy-Level Photosynthetic Activities. *REMOTE SENSING*, 12(2), 22 pages. doi:[10.3390/rs12020315](https://doi.org/10.3390/rs12020315)
- Joseph, S. (2020). Ingestion of Novaluron Elicits Transovarial Activity in Stephanitis pyrioides (Hemiptera: Tingidae). *INSECTS*, 11(4), 10 pages. doi:[10.3390/insects11040216](https://doi.org/10.3390/insects11040216)
- Joseph, S., & Iudice, S. (2020). Evaluation of seedling tray drench of insecticides for cabbage maggot (Diptera: Anthomyiidae) management in broccoli and cauliflower. *FLORIDA ENTOMOLOGIST*, 103(2), 172-179. doi:[10.1653/024.103.0204](https://doi.org/10.1653/024.103.0204)

# Publications 2020

- Joseph, S. V. (2020). Effect of Afidopyropen against *Myzus persicae* (Hemiptera: Aphididae) and Its Predator, *Adalia bipunctata* (L.) in a Greenhouse. *JOURNAL OF ENTOMOLOGICAL SCIENCE*, 55(4), 584-587. doi:[10.18474/0749-8004-55.4.584](https://doi.org/10.18474/0749-8004-55.4.584)
- Joseph, S. V. (2020). Repellent effects of insecticides on *Stephanitis pyrioides* Scott (Hemiptera: Tingidae) under laboratory conditions. *CROP PROTECTION*, 127, 9 pages. doi:[10.1016/j.cropro.2019.104985](https://doi.org/10.1016/j.cropro.2019.104985)
- Joseph, S., Harris-Shultz, K., Jespersen, D., Vermeer, B., & Julian, C. (2020). Incidence and Abundance of Bees and Wasps (Hymenoptera) in Centipede-grass Lawns in Georgia. *JOURNAL OF ENTOMOLOGICAL SCIENCE*, 55(4), 547-559. doi:[10.18474/0749-8004-55.4.547](https://doi.org/10.18474/0749-8004-55.4.547)
- Khan, F. Z. A., & Joseph, S. (2020). Characterization of impressions created by turfgrass arthropods on clay models. *ENTOMOLOGIA EXPERIMENTALIS ET APPLICATA*, 11 pages. doi:[10.1111/eea.13000](https://doi.org/10.1111/eea.13000)
- Khan, F. Z. A., Manzoor, S. A., Akmal, M., Imran, M. U., Taqi, M., Manzoor, S. A., . . . Joseph, S. V. (2020). Modeling pesticide use intention in Pakistani farmers using expanded versions of the theory of planned behavior. *HUMAN AND ECOLOGICAL RISK ASSESSMENT*, 21 pages. doi:[10.1080/10807039.2020.1750345](https://doi.org/10.1080/10807039.2020.1750345)
- Khan, R. A., Seal, D. R., Zhang, S., Liburd, O. E., Srinivasan, R., & Evans, E. (2020). Distribution Pattern of Thrips (Thysanoptera: Thripidae) and Tomato Chlorotic Spot Virus in South Florida Tomato Fields. *ENVIRONMENTAL ENTOMOLOGY*, 49(1), 73-87. doi:[10.1093/ee/nvz153](https://doi.org/10.1093/ee/nvz153)
- Kheirodin, A., Simmons, A. M., Legaspi, J. C., Grabarczyk, E. E., Toews, M. D., Roberts, P. M., . . . Schmidt, J. M. (2020). Can Generalist Predators Control *Bemisia tabaci*? *INSECTS*, 11(11), 21 pages. doi:[10.3390/insects11110823](https://doi.org/10.3390/insects11110823)
- Kleczewski, N. M., Plewa, D. E., Bissonnette, K. M., Bowman, N. D., Byrne, J. M., LaForest, J., . . . Telenko, D. E. P. (2020). Documenting the Establishment, Spread, and Severity of *Phyllachora maydis* on Corn, in the United States. *JOURNAL OF INTEGRATED PEST MANAGEMENT*, 11(1), 5 pages. doi:[10.1093/jipm/pmaa012](https://doi.org/10.1093/jipm/pmaa012)
- Koralewski, T. E., Wang, H. -H., Grant, W. E., LaForest, J. H., Brewer, M. J., Elliott, N. C., & Westbrook, J. K. (2020). Toward near-real-time forecasts of airborne crop pests: Aphid invasions of cereal grains in North America. *COMPUTERS AND ELECTRONICS IN AGRICULTURE*, 179, 6 pages. doi:[10.1016/j.compag.2020.105861](https://doi.org/10.1016/j.compag.2020.105861)
- Krey, K. L., Nability, P. D., Blubaugh, C. K., Fu, Z., Van Leuven, J. T., Reganold, J. P., . . . Snyder, W. E. (2020). Organic Farming Sharpens Plant Defenses in the Field. *Front Sustain Food Syst*, 4. doi:[10.3389/fsufs.2020.00097](https://doi.org/10.3389/fsufs.2020.00097)
- Krupa, J. J., Hopper, K. R., Gruber, S. B., Schmidt, J. M., & Harwood, J. D. (2020). Plant–animal interactions between carnivorous plants, sheet-web spiders, and ground-running spiders as guild predators in a wet meadow community. *Ecology and Evolution*, 10(11), 4762-4772. doi:[10.1002/ece3.6230](https://doi.org/10.1002/ece3.6230)
- Lahiri, S., Ni, X., Buntin, G. D., & Toews, M. D. (2020). Parasitism of *Melanaphis sacchari* (Hemiptera: Aphididae) by *Lysiphlebus testaceipes* (Hymenoptera: Braconidae) in the Greenhouse and Field. *JOURNAL OF ENTOMOLOGICAL SCIENCE*, 55(1), 14-24. doi:[10.18474/0749-8004-55.1.14](https://doi.org/10.18474/0749-8004-55.1.14)
- Latimer, C. E., Smith, O. M., Taylor, J. M., Edworthy, A. B., Owen, J. P., Snyder, W. E., & Kennedy, C. M. (2020). Landscape context mediates the physiological stress response of birds to farmland diversification. *JOURNAL OF APPLIED ECOLOGY*, 57(4), 671-680. doi:[10.1111/1365-2664.13583](https://doi.org/10.1111/1365-2664.13583)
- Legarra, S., Barman, A., Diffie, S., & Srinivasan, R. (2020). Virus Accumulation and Whitefly Performance Modulate the Role of Alternate Host Species as Inoculum Sources of Tomato Yellow Leaf Curl Virus. *PLANT DISEASE*, 104(11), 2958-2966. doi:[10.1094/PDIS-09-19-1853-RE](https://doi.org/10.1094/PDIS-09-19-1853-RE)
- Lewis, D. G., Cutulle, M. A., Schmidt-Jeffris, R. A., & Blubaugh, C. K. (2020). Better Together? Combining Cover Crop Mulches, Organic Herbicides, and Weed Seed Biological Control in Reduced-Tillage Systems. *ENVIRONMENTAL ENTOMOLOGY*, 49(6), 1327-1334. doi:[10.1093/ee/nvaa105](https://doi.org/10.1093/ee/nvaa105)
- Madden, M. K., Widick, I. V., & Blubaugh, C. K. (2021). Weeds Impose Unique Outcomes for Pests, Natural Enemies, and Yield in Two Vegetable Crops. *Environ Entomol.* doi:[10.1093/ee/nvaa168](https://doi.org/10.1093/ee/nvaa168)

# Publications 2020

- Marchant, W. G., Gautam, S., Hutton, S. F., & Srinivasan, R. (2020). Tomato Yellow Leaf Curl Virus-Resistant and -Susceptible Tomato Genotypes Similarly Impact the Virus Population Genetics. *FRONTIERS IN PLANT SCIENCE*, 11, 17 pages. doi:[10.3389/fpls.2020.599697](https://doi.org/10.3389/fpls.2020.599697)
- Marchant, W. G., Legarrea, S., Smeda, J. R., Mutschler, M. A., & Srinivasan, R. (2020). Evaluating Acylsugars-Mediated Resistance in Tomato against *Bemisia tabaci* and Transmission of Tomato Yellow Leaf Curl Virus. *INSECTS*, 11(12), 18 pages. doi:[10.3390/insects11120842](https://doi.org/10.3390/insects11120842)
- Matteson, C. T., Jackson, C. R., Batzer, D. P., Wilde, S. B., & Jeffers, J. B. (2020). Nitrogen and Phosphorus Gradients from a Working Farm through Wetlands to Streams in the Georgia Piedmont, USA. *WETLANDS*, 40(6), 2139-2149. doi:[10.1007/s13157-020-01335-z](https://doi.org/10.1007/s13157-020-01335-z)
- Mermer, S., Hunter, J., Sial, A., Pfab, F., Isaacs, R., Fanning, P., . . . Walton, V. (2020). Timing and order of different insecticide classes drive control of *Drosophila suzukii*; a modeling approach. *Journal of Pest Science*. doi:[10.1007/s10340-020-01292-w](https://doi.org/10.1007/s10340-020-01292-w)
- Miller, T., Crossley, M. S., Fu, Z., Meier, A. R., Crowder, D. W., & Snyder, W. E. (2020). Exposure to predators, but not intraspecific competitors, heightens herbivore susceptibility to entomopathogens. *BIOLOGICAL CONTROL*, 151, 6 pages. doi:[10.1016/j.biocontrol.2020.104403](https://doi.org/10.1016/j.biocontrol.2020.104403)
- Moore, P., Amukamara, A., Washington, J., Sanchez, Z., Schmitz, R., Moore, A., & Mckinney, E. (2020). More than DNA methylation: does pleiotropy drive the complex pattern of evolution of *Dnmt1*?. *Frontiers in Ecology and Evolution*. doi:[10.3389/fevo.2020.00004](https://doi.org/10.3389/fevo.2020.00004)
- Morgado, F. D. S., Silva, L. A., Bernardes, L. M., Czepak, C., Strand, M. R., & Ribeiro, B. M. (2020). *Trichoplusia ni* and *Chrysodeixis includens* larvae show different susceptibility to *Chrysodeixis includens* single nucleopolyhedrovirus per os infection. *JOURNAL OF PEST SCIENCE*, 93(3), 1019-1029. doi:[10.1007/s10340-020-01217-7](https://doi.org/10.1007/s10340-020-01217-7)
- Murray-Stoker, K. M., Batzer, D. P., Murray-Stoker, D., & McHugh, J. (2019). Shifts in the community composition of caddisflies (Insecta: Trichoptera) in a subtropical river over three decades. *ECOLOGICAL ENTOMOLOGY*, 45(3), 514-524. doi:[10.1111/een.12822](https://doi.org/10.1111/een.12822)
- Olimpi, E. M., Garcia, K., Gonthier, D. J., De Master, K. T., Echeverri, A., Kremen, C., . . . Karp, D. S. (2020). Shifts in species interactions and farming contexts mediate net effects of birds in agroecosystems. *ECOLOGICAL APPLICATIONS*, 30(5), 14 pages. doi:[10.1002/eap.2115](https://doi.org/10.1002/eap.2115)
- Pang, H., Tang, X. -F., Booth, R. G., Vandenberg, N., Forrester, J., Mchugh, J., & Slimski, A. (2020). REVISION OF THE AUSTRALIAN COCCINELLIDAE (COLEOPTERA). GENUS NOVIUS MULSANT OF TRIBE NOVIINI. *ANNALES ZOOLOGICI*, 70(1), 1-24. doi:[10.3161/00034541ANZ2020.70.1.001](https://doi.org/10.3161/00034541ANZ2020.70.1.001)
- Raeman, R., Hua, G., Zhang, Q., & Adang, M. J. (2020). Fluorescent analyses of *Bacillus thuringiensis* Cry1Fa and Cry1Ab toxin binding sites on brush border membrane vesicles of *Ostrinia nubilalis* (Hubner), *Diatraea grandiosella* (Dyar), and *Helicoverpa zea* (Boddie) larvae. *PESTICIDE BIOCHEMISTRY AND PHYSIOLOGY*, 167, 7 pages. doi:[10.1016/j.pestbp.2020.104592](https://doi.org/10.1016/j.pestbp.2020.104592)
- Riaz, M. A., Adang, M. J., Hua, G., Teodoro Rezende, T. M., Rezende, A. M., & Shen, G. -M. (2020). Identification of *Lysinibacillus sphaericus* Binary toxin binding proteins in a malarial mosquito cell line by proteomics: A novel approach towards improving mosquito control. *JOURNAL OF PROTEOMICS*, 227, 9 pages. doi:[10.1016/j.jprot.2020.103918](https://doi.org/10.1016/j.jprot.2020.103918)
- Riley, D., Smith, H., Bennett, J., Torrance, P., Huffman, E., Sparks, A., . . . Champagne, D. (2020). Regional Survey of Diamondback Moth (Lepidoptera: Plutellidae) Response to Maximum Dosages of Insecticides in Georgia and Florida. *JOURNAL OF ECONOMIC ENTOMOLOGY*, 113(5), 2458-2464. doi:[10.1093/jee/toaa125](https://doi.org/10.1093/jee/toaa125)
- Schöneberg, T., Lewis, M. T., Burrack, H. J., Grieshop, M., Isaacs, R., Rendon, D., . . . Hamby, K. A. (2021). Cultural Control of *Drosophila suzukii* in Small Fruit-Current and Pending Tactics in the U.S.. *Insects*, 12(2). doi:[10.3390/insects12020172](https://doi.org/10.3390/insects12020172)

# Publications 2020

- Schoneberg, T., Sial, A., Arsenault-Benoit, A., Taylor, C., Butler, B., Dalton, D., . . . Hamby, K. (2020). Small fruit canopy density can affect suitability for *Drosophila suzukii*. *Agriculture, Ecosystems and Environment*, 294. doi:[10.1016/j.agee.2020.106860](https://doi.org/10.1016/j.agee.2020.106860)
- Schmidt, J., Bowers, C., & Toews, M. (2020). Beyond soil health: the trophic effects of cover crops shape predator communities. doi:[10.1101/2020.03.28.013409](https://doi.org/10.1101/2020.03.28.013409)
- Sharanowski, B. J., Ridenbaugh, R. D., Piekarski, P. K., Broad, G. R., Burke, G. R., Deans, A. R., . . . Hines, H. M. (2021). Phylogenomics of Ichneumonidae (Hymenoptera) and implications for evolution of mode of parasitism and viral endogenization. *Mol Phylogenet Evol*, 156, 107023. doi:[10.1016/j.ympev.2020.107023](https://doi.org/10.1016/j.ympev.2020.107023)
- Shelby, E. A., Moss, J. B., Andreason, S. A., Simmons, A. M., Moore, A. J., & Moore, P. J. (2020). Debugging: Strategies and Considerations for Efficient RNAi-Mediated Control of the Whitefly *Bemisia tabaci*. *INSECTS*, 11(11), 12 pages. doi:[10.3390/insects11110723](https://doi.org/10.3390/insects11110723)
- Singh, G., Joseph, S., & Schwartz, B. (2020). Screening Newly Developed Bermudagrasses for Host Plant Resistance against Fall Armyworm (Lepidoptera: Noctuidae). *HORTSCIENCE*, 55(11), 1811-1816. doi:[10.21273/HORTSCI15293-20](https://doi.org/10.21273/HORTSCI15293-20)
- Smith, A. H., O'Connor, M., Deal, B., Kotzer, C., Lee, A., Wagner, B., . . . Russell, J. A. (2020). Does getting defensive get you anywhere?--- Seasonally varying selection in pea aphids shapes a dynamic infection polymorphism with a protective bacterial endosymbiont. *Authorea*. doi:[10.22541/au.159413207.73066852](https://doi.org/10.22541/au.159413207.73066852)
- Smith, O. M., Edworthy, A., Taylor, J. M., Jones, M. S., Tormanen, A., Kennedy, C. M., . . . Owen, J. P. (2020). Agricultural intensification heightens food safety risks posed by wild birds. *JOURNAL OF APPLIED ECOLOGY*, 57(11), 2246-2257. doi:[10.1111/1365-2664.13723](https://doi.org/10.1111/1365-2664.13723)
- Smith, O. M., Snyder, W. E., & Owen, J. P. (2020). Are we overestimating risk of enteric pathogen spillover from wild birds to humans?. *BIOLOGICAL REVIEWS*, 95(3), 652-679. doi:[10.1111/brv.12581](https://doi.org/10.1111/brv.12581)
- Sparks, T. C., Riley, D. G., Simmons, A. M., & Guo, L. (2020). Comparison of Toxicological Bioassays for Whiteflies. *INSECTS*, 11(11), 15 pages. doi:[10.3390/insects11110789](https://doi.org/10.3390/insects11110789)
- Stenert, C., Pires, M. M., Epele, L. B., Grech, M. G., Maltchik, L., McLean, K., . . . Batzer, D. P. (2020). Climate- versus geographic-dependent patterns in the spatial distribution of macroinvertebrate assemblages in New World depressional wetlands. *GLOBAL CHANGE BIOLOGY*, 26(12), 6895-6903. doi:[10.1111/gcb.15367](https://doi.org/10.1111/gcb.15367)
- Stumpf, S., Leach, L., Srinivasan, R., Coolong, T., Gitaitis, R., & Dutta, B. (2021). Foliar Chemical Protection Against *Pantoea ananatis* in Onion Is Negated by Thrips Feeding. *Phytopathology*, 111(2), 258-267. doi:[10.1094/PHYTO-05-20-0163-R](https://doi.org/10.1094/PHYTO-05-20-0163-R)
- Sutherland, W. J., Alvarez-Castaneda, S. T., Amano, T., Ambrosini, R., Atkinson, P., Baxter, J. M., . . . Wordley, C. (2020). Ensuring tests of conservation interventions build on existing literature. *CONSERVATION BIOLOGY*, 34(4), 781-783. doi:[10.1111/cobi.13555](https://doi.org/10.1111/cobi.13555)
- Taylor, J. M., & Snyder, W. E. (2020). Are specialists really safer than generalists for classical biocontrol?. *BIOCONTROL*, 66(1), 9-22. doi:[10.1007/s10526-020-10037-8](https://doi.org/10.1007/s10526-020-10037-8)
- Thomas, G. W. C., Dohmen, E., Hughes, D. S. T., Murali, S. C., Poelchau, M., Glastad, K., . . . Richards, S. (2020). Gene content evolution in the arthropods. *GENOME BIOLOGY*, 21(1), 14 pages. doi:[10.1186/s13059-019-1925-7](https://doi.org/10.1186/s13059-019-1925-7)
- Tillman, G., Toews, M., Blaauw, B., Sial, A., Cottrell, T., Talamas, E., . . . Lahiri, S. (2020). Parasitism and predation of sentinel eggs of the invasive brown marmorated stink bug, *Halyomorpha halys* (Hemiptera: Pentatomidae) in the southeastern US. *Biological Control*, 145. doi:[10.1016/j.biocontrol.2020.104247](https://doi.org/10.1016/j.biocontrol.2020.104247)

# Publications 2020

Torrance, T. N., & Abney, M. R. (2020). Efficacy of Select Insecticides Against Threecornered Alfalfa Hopper in Peanut, 2019. *Arthropod Management Tests*, 45(1). doi:[10.1093/amt/tsaa085](https://doi.org/10.1093/amt/tsaa085)

Usman, M., Gulzar, S., Wakil, W., Wu, S., Pinero, J. C., Leskey, T. C., . . . Shapiro-Ilan, D. (2020). Virulence of Entomopathogenic Fungi to *Rhagoletis pomonella* (Diptera: Tephritidae) and Interactions With Entomopathogenic Nematodes. *JOURNAL OF ECONOMIC ENTOMOLOGY*, 113(6), 2627-2633. doi:[10.1093/jee/toaa209](https://doi.org/10.1093/jee/toaa209)

V. Joseph, S., Harris-Shultz, K., & Jespersen, D. (2020). Evidence of Pollinators Foraging on Centipede-grass Inflorescences. *INSECTS*, 11(11), 8 pages. doi:[10.3390/insects11110795](https://doi.org/10.3390/insects11110795)

Virk, S., Porter, W., Snider, J., Whitaker, J., Rains, G., & Li, C. (2020). Influence of Seeding Rate, Planter Downforce and Cultivar on Crop Emergence and Yield in Singulated and Hill-Dropped Cotton. *Journal of Cotton Science*, 24, 137-147.

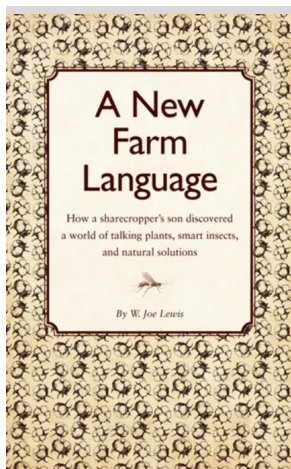
Virk, S. S., Porter, W. M., Li, C., Rains, G. C., Snider, J. L., & Whitaker, J. R. (2020). On-farm evaluation of planter downforce in varying soil textures within grower fields. *PRECISION AGRICULTURE*, 23 pages. doi:[10.1007/s11119-020-09755-x](https://doi.org/10.1007/s11119-020-09755-x)

Weldon, S. R., Russell, J. A., & Oliver, K. M. (2020). More Is Not Always Better: Coinfections with Defensive Symbionts Generate Highly Variable Outcomes. *APPLIED AND ENVIRONMENTAL MICROBIOLOGY*, 86(5), 14 pages. doi:[10.1128/AEM.02537-19](https://doi.org/10.1128/AEM.02537-19)

Wu, S., Toews, M. D., Oliveira-Hofman, C., Behle, R. W., Simmons, A. M., & Shapiro-Ilan, D. I. (2020). Environmental Tolerance of Entomopathogenic Fungi: A New Strain of *Cordyceps javanica* Isolated from a Whitefly Epizootic Versus Commercial Fungal Strains. *INSECTS*, 11(10), 15 pages. doi:[10.3390/insects11100711](https://doi.org/10.3390/insects11100711)

Yan, Z., Martin, S. H., Gotzek, D., Arsenault, S. V., Duchon, P., Helleu, Q., . . . Keller, L. (2020). Evolution of a super-gene that regulates a trans-species social polymorphism. *NATURE ECOLOGY & EVOLUTION*, 4(2), 240+.  
doi:[10.1038/s41559-019-1081-1](https://doi.org/10.1038/s41559-019-1081-1)

## Book Review



**By Dr. Robert Matthews**

BOOK NOTICE: W. Joe Lewis, a retired research entomologist formerly at the USDA Entomology lab in Tifton, GA, where he regularly interacted with UGA students and faculty, has recently published a book that will be of interest to all entomologists. His pioneering and fundamental discoveries of behavioral and chemical interactions of parasitoids, insect herbivores, and plants – essentially how plants use “SOS” signals to recruit beneficial insects to their defense – have been recognized world-wide. His new book, “**A New Farm Language**” recounts many of these stories in an engaging style and is a fun ‘must read’. – Bob Matthews, UGA Josiah Meigs Professor of Entomology, Emeritus

<https://bookstore.acresusa.com/collections/new-titles/products/a-new-farm-language>

# Publications 2020

## **Books**

Delaplane, K., Tew, J., Berry, J., Collison, C., Harman, A., & Flottum, K. (2020). *The ABC & XYZ of Bee Culture, 42d edition*. K. Delaplane (Ed.), A.I. Root Co..

Drake, J. (2020). *Population Biology of Vector-borne Diseases*. J. Drake, M. Bonsall, & M. Strand (Eds.), Oxford University Press.

Oliver, K., & Russell, J. (2020). *Mechanisms underlying microbial symbiosis* (Vol. 58). K. Oliver, & J. Russell (Eds.), London: Elsevier. Retrieved from <https://www.elsevier.com/>

## **Book Chapters**

Coon, K., & Strand, M. (2020). Gut microbiome assembly and function in mosquitoes. In *Population Biology of Vector-Borne Diseases* (pp. 229-246).

Drake, J., Bonsall, M., & Strand, M. (2021). Current topics in the population biology of infectious diseases. In *Population Biology of Vector-borne Diseases*.

Hinkle, N., & Corrigan, R. (2020). External Parasites and Poultry Pests. In *Diseases of Poultry* (pp. 1137-1156).

Oliver, K. M., & Perlman, S. J. (2020). Toxin-mediated protection against natural enemies by insect defensive symbionts. In K. M. Oliver, & J. A. Russell (Eds.), *MECHANISMS UNDERLYING MICROBIAL SYMBIOSIS* (Vol. 58, pp. 277-316). ACADEMIC PRESS LTD-ELSEVIER SCIENCE LTD. doi:[10.1016/bs.aiip.2020.03.005](https://doi.org/10.1016/bs.aiip.2020.03.005)

Russell, J. A., & Oliver, K. M. (2020). Mechanisms underlying microbial symbiosis. In K. M. Oliver, & J. A. Russell (Eds.), *MECHANISMS UNDERLYING MICROBIAL SYMBIOSIS* (Vol. 58, pp. 1-25). ACADEMIC PRESS LTD-ELSEVIER SCIENCE LTD. doi:[10.1016/bs.aiip.2020.04.003](https://doi.org/10.1016/bs.aiip.2020.04.003)

Sparks, A., & Riley, D. (2020). Commercial Vegetable Insect Control. In *Georgia Pest Management Handbook - 2020 Commercial Edition* (pp. 309-363)

Sparks, A. (2020). Home Vegetable Insect Control. In *Georgia Pest Management Handbook - 2020 Home and Garden Edition* (pp. 145-153).

Sulc, R. M., Lamp, W. O., & Buntin, G. (2020). Insect management.. In K. Moore (Ed.), *In: K. Moore et al. (ed.) Forages, the science of grassland agriculture. Vol. II, 7th ed. John Wiley & Sons, West Sussex, UK.* (Vol. II, 7th ed., pp. 535-552). John Wiley & Sons.

Vogel, K. J., & Coon, K. L. (2020). Functions and mechanisms of symbionts of insect disease vectors. In K. M. Oliver, & J. A. Russell (Eds.), *MECHANISMS UNDERLYING MICROBIAL SYMBIOSIS* (Vol. 58, pp. 233-275). ACADEMIC PRESS LTD-ELSEVIER SCIENCE LTD. doi:[10.1016/bs.aiip.2020.03.004](https://doi.org/10.1016/bs.aiip.2020.03.004)

# SNAPSHOTS



ANOTHER WINTER TURNS TO SPRING ...

# FRIENDS OF IPM AWARDS



The Southern IPM Center's Friends of IPM program recognizes extraordinary achievement in research, Extension, and implementation of Integrated Pest Management (IPM) in the Southern Region of the United States. This year, three UGA Entomology faculty members were honored.

**Dr. Nancy Hinkle** received the **Lifetime Achievement Award** for her extraordinary achievements in research and Extension over a career in Veterinary Entomology. Because most veterinary pests are considered urban pests (fleas, ticks, flies, etc.), not only is Dr. Hinkle considered an expert in animal pests, but she likewise is viewed as an authority on household pests and their suppression. Throughout her career, Dr. Hinkle's research and Extension outreach have improved IPM by developing IPM programs that are conveyed to Extension audiences, including livestock and poultry producers, Extension agents, and pest management professionals.

Because so few veterinary entomologists are employed in academia, her program has spanned the range of veterinary pests, focusing mostly on those affecting livestock, poultry, and companion animals. Not only does she emphasize that animal agriculture needs integrated pest suppression options, but she acquaints her pre-med students with IPM approaches as critical in the One Health concept, encompassing human, animal and environmental health.

**Dr. Alton "Stormy" Sparks** was awarded the **IPM Implementer Friends of IPM award** which recognizes "on the ground" implementation of IPM, specifically to IPM practitioners. Dr. Sparks 30+ year career has primarily emphasized applied research and extension activities addressing management of pests in agricultural commodities. Stormy has served with UGA Extension as the Extension Entomologist with primary responsibilities for insect pest management in commercial vegetable production. His activities have emphasized proper integration of insecticides into pest management programs in commercial vegetable production, while also addressing pest biology, judicious use of pesticides, and production systems impacts on pest problems. His research and Extension programs have remained flexible to allow adjusting emphasis with emerging problems, and is known as an outstanding applied entomologist who works directly with farmers to help them implement IPM programs.



**The Pulling Together Friends of IPM Award** was presented to the Sustainable Spotted Wing Drosophila Management Team led by **Dr. Ashfaq Sial** of UGA Entomology. This award is given to a group who has been successful in any aspect of developing, teaching about, and implementing IPM, and is based on management of a high-priority pest. The Spotted Wing Drosophila (SWD) group came together in 2008 shortly after the pest was detected for the first time in California. The group is made up of leading researchers from 16 land-grant universities and USDA-ARS and represents a sustained, over a decade-long, adaptive collaboration of entomologists, geneticists, economists, social scientists, and growers joined together to respond to the devastating impact of SWD on the affected crops throughout the United States.



# Lampyridae intern project showcases Museum collections, importance to research



*By Joe McHugh*

The COVID pandemic presented problems for the UGA Collection of Arthropods, many related to the Museum Building being closed to non-staff. As a result, the UGCA accepted only one undergraduate intern this spring, Kerstin Thulé, a senior majoring in Ecology with a minor in Entomology. Originally, she was expected to work in the Biological Sciences Building preparing specimens off-site but as the spring term progressed, another option arose. Since the classroom at the museum was vacant during the shutdown, Kerstin would be able to work there in isolation without raising any personal health risks.

For her primary internship project, Kerstin curated the holdings of Lampyridae (“fireflies” or “Lightning bugs”). Her work involved incorporating a large number of recently acquired specimens into the collection and reorganizing all the lampyrid material to fit the current classification of subfamilies, genera and species. The final steps of her project were to re-label all the specimen trays and drawers, and update the publicly available database of specimen holdings.

Curating our 5,181 specimens of lampyrid beetles was a high-priority project because the group attracts a great deal of research interest. In fact, the UGCA has been visited recently by multiple lampyrid specialists who came to study our material. In addition, there are active research programs on these beetles at UGA and institutions in neighboring states. A collaboration of Drs. Kathrin Stanger-Hall (UGA Plant Sciences Dept.), Joe McHugh (UGA Entomology Dept. & UGCA Curator), and Luiz Silveira (Western Carolina State University) resulted in an NSF grant proposal submission this spring to support research on neotropical lampyrids. If the project is funded, the UGCA specimens would be used extensively for research and training of students.

During his first visit to the UGCA, Dr. Silveira, a taxonomic expert of Lampyridae who has worked in museums around the world, remarked that he was “quite surprised by the size and geographical coverage of the collection.” Silveira emphasized that it was especially noteworthy that the UGCA “has a large representation of western Amazon (eastern Ecuador and northwestern Brazil) lampyrids, something that I’ve never seen before. Also, it houses the largest series of Central American species I’ve seen so far.”

Sadly, some of this valuable neotropical lampyrid material was collected from habitats that have since been severely degraded or destroyed. Although upsetting, loss of habitat is one reason natural history museum collections are so important; they provide an historical record of which species occurred in specific locations at particular times in the past.

Even though the pandemic caused many obstacles for the operation of the museum, Kirsten Thulé’s spring project has been a great success and will facilitate research on a fascinating group of insects for the foreseeable future.



## Hexapod Herald Subscriptions

*Michele Hatcher Editor*

The Hexapod Herald will be issued in **Spring, Summer** and **Fall** of each year. We ask that you share this issue with friends and neighbors, and anyone who is interested in UGA Entomology. Due to printing & mailing costs, a limited number of hard copies will be produced & mailed. Electronic subscription is preferred.



To subscribe to the Hexapod Herald, contact us  
Write to Hexapod Herald,  
413 Biological Sciences



Bldg, UGA Campus,  
Athens, GA 30602 or



send e-mail to  
entodept@uga.edu

Or Call 706-542-2816.

### Call for Twitter Content!

We have launched a new Twitter account **@Entomology\_UGA**. This platform will showcase the work of our students, post-docs, faculty and staff, celebrate publications and share relevant news. Please send name and info to [entosocialmedia@uga.edu](mailto:entosocialmedia@uga.edu) and use **#EntoUGA** and **#EntoDAWGS** in your own tweets, follow us and tag us **@Entomology\_UGA!**

## Community Education



**Dr. Nancy Hinkle** talks with Zac Summers from CBS46 News Atlanta about the impending emergence of the Brood X Cicadas in North Georgia. Hinkle described the insects emergence after 17 years and their deafening love song as “phenomenal and beneficial.” As the red-eyed black insects work their way up out of the ground, they release sequestered nutrients which can then be accessed by organisms in the environment. After arriving topside, they mate, lay eggs and soon the newly hatched insects work their way back into the ground to begin the 17-year cycle again.

## Students name quilt in entomological contest

UGA Entomology graduate students are a creative bunch!



In March an Atlanta quilter contacted the Department, asking that the entomology students help name her quilt, so we made it a contest. A call went out to all the graduate students, with a picture of the quilt, asking for their suggestions. Eight very appropriate responses were received and submitted to the quilter who selected, “**The Painted Ladies**,” proposed by **Emily Shelby**.

Because the quilter considered all the entries

excellent, she sent tokens of her appreciation (and admiration) to be presented to all eight students. The awards ceremony was held on March 4<sup>th</sup>, with Entomology Department Head Dr. Kris Braman making the presentations. The quilter had handmade reversible UGA masks for each participant. Ms. Kilmark wanted to emphasize that she was crazy about all the titles and regretted that she could choose only one. “Painted Ladies” will be entered in competition at the annual Mountain Quiltfest in Pigeon Forge, Tennessee, May 2021.



## Calendar Reminders

May 13-15 — UGA Undergraduate Commencement Ceremony; Sanford Stadium — 7:30 pm

May 13 — CAES Spring Convocation (Virtual)

May 31 — Memorial Day Holiday

July 5 — UGA Holiday

August 18— Fall Semester Classes begin



## We don't mean to bug you but . . .



Your investment in our entomology program helps assure our continued student recruitment success. No gift is too small. Your support is just the means needed to help our students spread their wings and fly!

The Donate button to the left may be used to donate online or, if you prefer, checks may be made payable to the “UGA Foundation” and should be sent to UGA CAES Office of External Relations, 117 Four Towers, Athens, GA 30602-7072. *Please indicate the program area or fund you wish to support.*

If you have any questions about making a gift to CAES, please contact the Office of External Relations at 706-542-3390 or email [external@uga.edu](mailto:external@uga.edu).



*UGA Entomology Cultivates Community  
by Planting for the Future*