

# Station News

The Connecticut Agricultural Experiment Station  
Volume 11 Issue 11 November 2021



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The mission of The Connecticut Agricultural Experiment Station is to develop, advance, and disseminate scientific knowledge, improve agricultural productivity and environmental quality, protect plants, and enhance human health and well-being through research for the benefit of Connecticut residents and the nation. Seeking solutions across a variety of disciplines for the benefit of urban, suburban, and rural communities, Station scientists remain committed to “Putting Science to Work for Society,” a motto as relevant today as it was at our founding in 1875.



# CAES

The Connecticut Agricultural Experiment Station

*Putting Science to Work for Society since 1875*

## GRANTS RECEIVED OCTOBER 2021

PI: Dr. Kevin Hockett (PSU), Co-PIs: **DR. LINDSAY TRIPLETT** (CAES) and Dr. Connie Chang (University of Montana). “The molecular basis of survival to membrane-targeting bacterial control methods, and implications for disease control.” USDA-NIFA Foundational Program A1112, Pests and Beneficial Species in Agricultural Production Systems. \$682,500 (\$176,914 to CAES). 1/2022-12/2025.

## ADMINISTRATION

**DR. JASON C. WHITE** participated in the monthly CT Laboratory Preparedness Teams call with the CT Department of Public Health and others (October 4); with **DR. JAYA BORGATTA** and **DR. WADE ELMER**, held a Zoom call with collaborators at Johns Hopkins University to discuss a joint research project on nanoscale phosphorus delivery (October 5, 26); participated by Zoom in the 2021 USDA AFRI Nanotechnology Annual Grantees’ Conference and gave presentations entitled “Biodegradable Polymer-Nanoparticle Composites for Controlled Release and Targeted Delivery of Phosphorus During Plant Growth” and “Nanoscale Sulfur for Plant Nutrition, Disease Suppression, and Food Safety” (October 6-7); with **DR. SARA NASON** and **DR. NUBIA ZUVERZA-MENA**, held a Zoom call with collaborators at Yale University and the University of Minnesota to discuss a joint NIEHS-funded research project on nano-enabled PFAS phytoremediation (October 6, 20); held a Zoom call with collaborators at São Paulo State University to discuss a project where two graduate students participate in an extended research stay at CAES (October 8); participated in the virtual biannual Center for Sustainable Nanotechnology (CSN) All-Hands meeting (October 11-12); hosted the quarterly CAES Board of Control meeting held at the Valley Laboratory (October 13); spoke with Professor Philip Demokritou of Rutgers University regarding collaborative research (October 14); met with Mr. Frank Greene of the CT Department of Consumer Protection to discuss the state metrology laboratory (October 14); held a Zoom call with collaborators at Augsburg University to discuss collaborative research and a Ph.D. student laboratory exchange (October 15); with **DR. YI WANG** and **DR. WADE ELMER**, hosted a meeting with collaborators at the University of Massachusetts to discuss a joint USDA research project on nanoscale sulfur (October 15); attended the 2021 TechConnect World Innovation Environmental Health and Safety Symposium in National Harbor, Maryland, and gave a presentation entitled “Enhancing Agrichemical Delivery and Plant Development with Biopolymer-Based Stimuli Responsive Nanoplatfoms” (October 18-20); participated in a Zoom call with collaborators at the CSN and Tuskegee University to discuss a collaborative research proposal (October 18); participated in a Zoom call with collaborators at the University of Parma, Italy, to discuss collaborative research that will occur during the research stay of Dr. Milica Pavličević at CAES (October 20); participated by Zoom in the bi-monthly Farmland Preservation Advisory Board meeting (October 21); attended (remotely) the International Sustainability Workshop 2021 (ISW 2021) at the Center for Sustainable Development of Qatar University, Doha, Qatar, and gave a keynote lecture entitled “Nano-Enabled Agriculture: A Path to Global Food Security?” (October 26); participated in the CSN weekly All-Hands call (October 27); hosted the monthly CAES J-1 Visa recipient meeting (October 29); and attended (remotely) the American Society of Plant Biologists Northeastern Section Meeting and gave a keynote presentation entitled “Nano-Enabled Strategies to Enhance Crop Tolerance to Biotic and Abiotic Stress” (October 30).

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STATION NEWS



كلية الآداب والعلوم  
College of Arts and Sciences  
QATAR UNIVERSITY جامعة قطر

مركز التنمية المستدامة  
Center for Sustainable Development



# International Sustainability Workshop (ISW 2021)

Center for Sustainable Development  
College of Arts and Sciences  
Qatar University

Organized within the Qatar Sustainability Week 2021

Via Microsoft Teams

And

Qatar University, Library (Building B13) Room 117

October 26-27, 2021  
*Hybrid Workshop*  
Qatar University, Doha, Qatar

## Speakers



Dr. Jason C. White  
Director  
The Connecticut Agricultural Experiment Station  
New Haven, CT  
USA

## ANALYTICAL CHEMISTRY

**DR. CHRISTINA ROBB** met with the Editor-in-Chief of *Journal of Liquid Chromatography* (October 3, 13, 28); attended Executive Committee meetings of the Eastern Analytical Symposium (EAS) (October 4, 11, 18, 25); was the co-presenter of “Applications and Uses of Portable and Handheld Infrared Spectroscopy” at Western Connecticut State University (WCSU) with John A. Seelenbinder of the American Chemical Society (October 13); participated in the APHL Food Chemistry Workgroup monthly call (October 13); attended the LC-GC virtual symposium “Emerging Trends in Liquid Chromatography” (October 13, 14, 15); met with the Chemistry and Nuclear Physics Portfolio Manager from Taylor and Francis (October 19); attended the FDA LFFM Chemistry Human and Animal Food (C-HAF) monthly conference call (October 20); and received training on the ON24 virtual platform (October 25).

## ENTOMOLOGY

**DR. KIRBY C. STAFFORD III** co-chaired a meeting of the Changing Dynamics of Tick Ecology, Personal Protection, and Tick Control Subcommittee of the Tick-Borne Disease Working Group (October 13); conducted a tick identification course for the NEVBD “boot camp” at Fordham University’s Louis Calder Center in Armonk, NY (7 attendees) (October 7); presented a keynote virtual talk entitled “Strategies and Challenges to the Management of Ticks and Tick-Borne Disease” for the Ohio Regional Tick Symposium (80 attendees) (October 15); presented a virtual talk on “Management of Ticks and Tick-Borne Disease” for the Vermont Pesticide Training program (112 attendees) (October 19); and participated in a meeting of the Midwest Center of Excellence for Vector-Borne Disease (MCEVBD) (21 attendees) (October 19).

**MS. TIA M. BLEVINS** completed the Invasive Insect Certification Program: For Landscape, Nursery and Urban Forest Pests, a six-session virtual webinar presented by the University of Massachusetts. Topics included Impact and Cost of Invasive Insects, Invasive Forest and Agricultural Insects, and Management of Invasive Forest and Landscape Insect Pests (September 28, 29; October 12, 13, 26, 27).

**DR. MEGAN LINSKE** participated as a panelist on women in wildlife for SUNY ESF undergraduate students (October 5); was elected chairperson of The CAES Post-doctoral Association (October 12); participated in a conference call with collaborators for the Department of Defense project entitled “Novel Evaluation of Control and Prevention Strategies for Ticks and Tick-borne Diseases” (October 27).

**DR. GOUDARZ MOLAEI** hosted Dr. Sajjad Hassan, MD, a Clinical Microbiology Fellow at the Yale School of Medicine, provided a tour of the Tick Testing Laboratory, and discussed tick and mosquito research projects (October 6); in the Tick Testing Laboratory, 224 blood-engorged adult blacklegged ticks were tested for Lyme disease, babesiosis, and anaplasmosis, and results were reported.

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Dr. Gale E. Ridge staffing a table at the Bethany Town Harvest Festival.

**DR. GALE E. RIDGE** staffed a table at the Bethany Town Harvest Festival (October 3). She combined the Sustainable Connecticut-Bethany and the Experiment Station programs into a single focus of addressing invasive species found in Connecticut. There were approximately 5,000 visitors who attended the one-day event.

**DR. CLAIRE E. RUTLEDGE** gave a presentation on southern pine beetles in Connecticut to the annual meeting of the Northeast-Midwest State Foresters Alliance Public Land Management Committee (representatives from 10 states attended) at Hopeville Pond State Park in Griswold (15 adults) (October 6); lectured on “Insects that Attack Trees” for the Connecticut Tree Protective Association’s Arboriculture 101 course held in Jones Auditorium (40 adults) (October 6); presented a lecture on “Biological Control of Emerald Ash Borer in Connecticut” via livestream for the Flanders Nature Center seminar series (7 adults) (October 14); and taught in the “Tree Conditions Laboratory” class for the Connecticut Tree Protective Association’s Arboriculture 101 course held in Jones Auditorium (40 adults) (October 20).

**DR. VICTORIA L. SMITH** received the 2020 Deputy Administrator’s Safeguarding Award for contributions to the Unsolicited Seed Response Team. The Team helped PPQ recover nearly 20,000 improperly imported seed packages and identified over 13,000 seeds. Team members also responded to more than 170 media inquiries and countless calls and emails from the public, who received the seeds. The Award consisted of a letter from APHIS Deputy Administrator Osama El-Lissy and a certificate.

**DR. KIMBERLY A. STONER** participated in the annual meeting of COLOSS (Society for the Prevention of Colony Loss of Honey Bees) online (October 14-15); and participated in the US National Native Bee Monitoring Workshop (October 22).

**MS. TRACY ZARRILLO** participated in the US National Native Bee Monitoring Workshop (October 22).

**DR. JOSEPH PIGNATELLO** participated in virtual update meetings with co-investigators from Villanova University, Pacific Northwest National Laboratory, and Oregon Health and Science University on a SERDP grant (October 1); met with co-investigators from the University of Maryland and GeoSyntec Corp. on a SERDP grant (October 13); met with co-investigators from the University of California Davis on a grant proposal (October 15); and met with Lockwood Lecture speaker Prof. Swadeshmukul Santra from the University of Central Florida (October 27).

**DR. PHILIP ARMSTRONG** was interviewed about the impact of climate change on mosquito populations and virus transmission by Channel 3 News and NBC CT (October 4) and by AccuWeather (October 20); and was interviewed about the record number of mosquitoes collected during 2021 by *The Connecticut Observer* (October 7).

**DR. DOUG BRACKNEY** gave a talk entitled “Catch Me If You Can: A Tale of Arbovirus Evolution and Innate Immunity” at The University of Connecticut Department of Pathobiology and Veterinary Sciences (approx. 35 attendees) (October 21).

**MS. ANGELA BRANSFIELD** participated in the Federal Select Agent Program’s Responsible Official webinar series on “Incident Notification and Reporting,” “Best Training Practices,” and “Work Objective Guidance” (October 13); participated in BioRAFT’s EHS Community Connection webinar “Self-Inspections - How Should We Use Them Best?” (October 21); and attended the American Biological Safety Association’s (ABSA) Business Meeting via Zoom (October 28).

**MR. GREGORY BUGBEE** spoke on “Hydrilla in the Connecticut River” at the annual meeting of the Connecticut River Gateway Commission held on the riverboat “RiverQuest” (approx. 65 attendees) (October 7).

**DR. ANREA GLORIA-SORIA** gave an invited presentation entitled “Highlights in Medical Entomology 2021” before the Medical, Urban, and Veterinary (MUVE) Section of the Entomological Society of America at the annual Entomological Society of America hybrid meeting in Denver, CO (100 on-site attendees, 25 virtual attendees) (October 31-November 3).

**DR. SARA NASON** presented a poster entitled “Phytoremediation of PFAS: Strategies for Improving Efficacy” at the FLUOROS Global conference in Providence, RI (approx. 40 on-site attendees plus virtual attendees) (October 3-7); was interviewed about her recent articles on sewage sludge analysis during the COVID-19 pandemic by Wiley Publicity (October 5-7 and 19-20 via email); met with collaborators at Yale regarding PFAS research (October 13); attended meetings of the Benchmarking and Publications for Non-Targeted Analysis working group (October 14, 18, 22, 27); hosted a visiting student researcher from Princeton University (October 19-21); and met with collaborators from Yale and the University of Minnesota regarding ongoing projects (October 20).

**DR. CHARLES VOSSBRINCK** recorded a lecture about growing figs in Connecticut with Theresa Hennessey from the University of Connecticut Master Gardener program (August 13).

## FORESTRY AND HORTICULTURE

**DR. JEFFREY S. WARD** spoke on forest management and ecology during a Sunday walk at Naugatuck State Forest in Hamden (4 attendees) (October 3); gave an invited talk on “Regenerating Oak in Southern New England” at the Northeast-Midwest State Foresters Alliance-Public Land Management Committee (NMSFA-PLMC) annual meeting in Mystic (17 attendees) (October 5); spoke on “Defoliation, Drought and Oak Mortality” at the NMSFA-PLMC field tour in Pachaug State Forest (18 attendees) (October 6); met with Will Hochholzer and CT DEEP Forestry staff in Portland to discuss influence of soil moisture indices on forest regeneration (October 14); spoke on forest management and succession at a Master Woodland Manager Module 2: Forest Ecology field workshop in North Madison (October 16); participated in a Forest Ecosystem Monitoring Cooperative State Coordinators Meeting (October 21); and spoke on developing diverse habitats at the Forest Management for Land Trusts field workshop in Madison (32 attendees) (October 22).

**DR. SUSANNA KERIÖ** gave an invited talk entitled “Trends in Urban Tree Stress in New England” at the New England International Society of Arborists 2021 Annual Conference and Trade Show in Manchester, NH (250 attendees) (October 4); gave a seminar entitled “From Genomics to Forest Management” for the Department of Horticulture and Landscape Architecture seminar series at the University of Connecticut Storrs campus (6 attendees) (October 15).

**DR. LEIGH WHITTINGHILL** held a virtual meeting with Brent Peterkin, Director of Gather New Haven, and discussed their current projects, issues, and potential future collaboration (October 22); went on a farm visit with Deborah Greig at Common Ground, toured the farm and discussed what they do, issues they have been having, and possible future collaborations (October 22); and met with Cyrena Thibodeau and Jaime Smith (CT DoAg) to discuss future research ideas and how they could help support our CAES urban agriculture work (October 27).

**DR. SCOTT C. WILLIAMS** met with Yale University researcher Dr. Sajjad Hassan to discuss tick ecology and integrated tick management (October 6); participated in a conference call for the Editorial Advisory Board for The Wildlife Society’s publication *The Wildlife Professional* (October 7); gave a research update to members of the Conservation Land Committee for Centennial Watershed State Forest, which includes staff from the CT DEEP Forestry Division, Aquarion Water Company, and The Nature Conservancy (9 attendees) (October 15); attended a Zoom graduate committee meeting for Cornell Master’s student Joseph Poggi (October 15); participated in a Zoom meeting with collaborators on the Department of Defense-funded research project entitled “Novel Evaluation of Control and Prevention Strategies for Ticks and Tick-Borne Diseases” (October 27); participated in a Zoom leadership meeting with collaborators on the Northeast Regional Center for Excellence in Vector-Borne Diseases (October 27).

**MR. JOSEPH P. BARSKY** was interviewed about hickory and oak mast seed production by the *Stamford Advocate* (October 1); coordinated installation of a new arboretum at Sleeping Giant State Park in an area impacted by tornadoes in May 2018 (October 3); participated in the monthly board meeting of the Sleeping Giant Park Association (October 12); presented a talk on “Trees and Forests” to students from Amity High School (28 students, 8 teachers and staff) (October 22); and was interviewed about the establishment of a new arboretum at Sleeping Giant State Park by *Giant News* (October 22).



Native trees delivered to the new arboretum at Sleeping Giant State Park in Hamden, CT.  
 Photo courtesy of J. P. Barsky.

**J. P. Barsky** coordinated the installation of a new arboretum at Sleeping Giant State Park to replace white pines destroyed by the tornadoes in May 2018. The trees were planted, mulched, and watered in under three hours with the assistance of roughly forty volunteers and CT DEEP staff. Eleven trees representing eight genera native to the eastern United States are shown being offloaded from a delivery truck.

## PLANT PATHOLOGY AND ECOLOGY

**DR. WADE ELMER**, with **DRS. JASON WHITE, CHRISTIAN DIMKPA, JAYA BORGATTA, ISHAQ ADISA**, and colleagues from Johns Hopkins University Zoom-conferenced for a NIFA grant project on nano P (7 attendees) (October 5); with **DR. JASON WHITE** and **MR. MICHAEL LAST**, attended the CAES Board of Control meeting in Windsor (7 attendees) (October 13); attended a NIFA plan of work conference webinar (122 attendees) (October 14); attended an APS Press Committee meeting (5 attendees) (October 15, 27); moderated the CNS Plant Nano Group meeting (26 attendees) (October 19); attended via Zoom the monthly APS Foundation Committee meeting (11 attendees) (October 20); attended via MS Teams the CT Management Advisory Council Meeting (126 attendees) (October 20); held a Zoom conference with Drs. Robert McGovern and Meg McGrath concerning their Springer publication (October 21); and attended the CT Management Advisory Council Meeting (162 attendees) (October 26).

**DR. WASHINGTON DA SILVA** participated and helped to organize the 2021 Grower Education presented by the Connecticut Farm Wine Development Council. Dr. Wayne Wilcox, a professor emeritus from Cornell University, shared his years of experiences on vineyard disease control and management to Connecticut grape growers. This was a virtual meeting on WebEx (50 attendees) (October 27).

**MS. ROSE HISKES** gave a talk entitled “Insects: The Good, the Beautiful, the Bad and the Just Plain Ugly” to the Daytime Gardeners of North Haven (11 attendees) (October 26).

**DR. YONGHAO LI** participated in the National Plant Diagnostic Network Poster and Exhibit Committee meeting via Zoom (5 adults) (October 4); gave a talk entitled “Gardening with Native Plants” for the Hill and Dale Garden Club in Glastonbury (25 adults) (October 7); participated in the National Plant Diagnostic Network Online Communication and Web Portal Committee meeting via Zoom (6



adults) (October 13); gave a lecture on “Diseases of Trees” for the Connecticut Tree Protective Association’s Arboriculture 101 Course held in Jones Auditorium (31 adults) (October 13); instructed “Tree Diseases” in the Hands-on Night for the Connecticut Tree Protective Association’s Arboriculture 101 Course held in Jones Auditorium (25 adults) (October 20).

**DR. ROBERT E. MARRA** presented a talk entitled “Fungi and Their Role in the Forest” to the New Canaan Garden Club at the New Canaan Nature Center (21 participants) (October 12); participated in a Beech Leaf Disease Working Group Zoom meeting with collaborators from Ohio, West Virginia, Ontario Canada, New York, USDA-ARS, and the US Forest Service (45 participants) (October 15); participated via MS Teams in the Forest Ecosystem Monitoring Cooperative State Coordinators meeting (25 participants) (October 21); and was interviewed via phone and email about beech leaf disease with *Science News* writer Grant Segall (October 26).

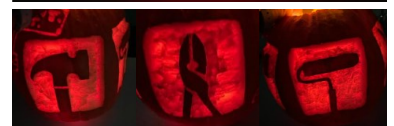
**DR. LINDSAY TRIPLETT** served as co-instructor of the Yale course MCDB380/680, “Advances in Plant Molecular Biology” and gave a three-week lecture module on “Plant-Biotic Interactions,” led three primary literature discussion sections, and graded student presentations and writing assignments (16 students) (October 8-November 5).

**DR. QUAN ZENG** participated in the 83rd Annual Meeting of Northeastern Tree Fruit Pest Management Workshop (October 15); gave an invited seminar entitled “Apple Flower Microbiome and Its Role in Plant Disease Infection” for the Dept. of Plant Pathology at University of California-Riverside (40 adults) (October 28).

**MISCELLANEOUS:** The first CAES pumpkin carving contest was held and the first prize was awarded to the Maintenance Department. **MR. MIKE SCOTT** (in costume as Michael Myers, *Halloween*) accepted the award from **DR. WADE ELMER**.



Mr. Mike Scott (in full costume) receiving the award from Dr. Wade Elmer on behalf of the Maintenance Department for best pumpkin carving.



## VALLEY LABORATORY

**DR. JATINDER S. AULAKH** visited a goldencreeper (*Thladiantha dubia*) site in Kent, CT and confirmed its presence in Connecticut (October 13); and was interviewed by Brian Scott-Smith, media consultant with WSHU Public Radio, about the goldencreeper discovery in Connecticut (October 29).

**DR. RICHARD COWLES** presented “Ticks and Spotted Lanternfly Biology” to the Connecticut Rose Society in Plainville (25 attendees) (October 3); spoke about “Spotted Lanternfly” to the Fairfield County Farm Bureau via Zoom (10 attendees) (October 4); discussed “Global Warming Science and Impacts to Agriculture” at the Cornell Club of Fairfield County hayride in Shelton (20 attendees) (October 24); and presented “Neonicotinoids and Bee Safety” to the North Central Conservation District via Zoom (12 attendees) (October 27).

**DR. JAMES LAMONDIA** spoke about “Epidemiology and Technical Integration for Boxwood Blight Management” during the virtual SCRI grant annual meeting (23 attendees) (October 5); participated in a virtual research update meeting on beech leaf disease (20 attendees) (October 15); and participated in the virtual Boxwood Blight Insight Group Epidemiology meeting (17 attendees) (October 25).

**DR. DEWEI LI** participated in the International Society for Mushroom Science (ISMS) e-Congress 2021 (September 14-17).

## DEPARTMENTAL RESEARCH UPDATES OCTOBER 2021

### ADMINISTRATION

1. **White, Jason C.**, and J. Gardea-Torresdey. 2021. Nanoscale agrochemicals for crop health: A key line of attack in the battle for global food security. *Environ. Sci. Technol.* 55, 20, 13413-13416.

**Abstract:** Safely and sustainably feeding the global population during the next three decades will be among the most significant challenges we face as a species. We have known this for some time. In June of 2009, the Food and Agriculture Organization (FAO) convened a three-day “Meeting of Experts” in Rome and a “High Level Experts Forum” at FAO headquarters in October of the same year. The question discussed was straightforward: “How to Feed the World in 2050.” The consensus was that solutions existed, and enough food could be produced by 2050, given the right conditions. Twelve years later, one could accurately argue that those solutions have been elusive. During this period, a number of conditions on the ground have changed or become more impactful than predicted. This includes a more rapidly changing climate and shortcomings in the global health and supply chain as evidenced during the COVID-19 pandemic. Although the question of global food security is straightforward, the issue and the solutions are highly complex and multi-faceted.

### ENTOMOLOGY

1. **Noelle Khalil, Eliza A. H. Little, Karen I. Akaratovic, Jay P. Kiser, Charles F. Abadam, Karen J. Yuan, Michael J. Misencik, Philip M. Armstrong, and Goudarz Molaei.** 2021. Host associations of *Culex pipiens*: A two-year analysis of bloodmeal sources and implications for arboviral transmission in southeastern Virginia. *Vector-Borne and Zoonotic Diseases*. Online ahead of print. <https://doi.org/10.1089/vbz.2021.0069>

**Abstract:** Understanding vector-host interactions is crucial for evaluating the role of mosquito species in enzootic cycling and epidemic/epizootic transmission of arboviruses, as well as assessing vertebrate host contributions to maintenance and amplification in different virus foci. To investigate blood-feeding pattern of *Culex pipiens*, engorged mosquitoes were collected on a weekly basis at 50 sites throughout Suffolk, Virginia, using Centers for Disease Control and Prevention miniature light traps, BG-Sentinel traps, and modified Reiter gravid traps. Vertebrate hosts of mosquitoes were identified by amplifying and sequencing portions of the mitochondrial *cytochrome b* gene. Of 281 *Cx. pipiens* bloodmeals successfully identified to species, 255 (90.7%) contained solely avian blood, 13 (4.6%) mammalian, 1 (0.4%) reptilian, and 12 (4.3%) both avian and mammalian blood. Nineteen avian species were identified as hosts for *Cx. pipiens* with American robin ( $n = 141$ , 55.3% of avian hosts) and northern cardinal ( $n = 57$ , 22.4%) as the most common hosts. More American robin feedings took place in areas of higher development. Three mammalian species were also identified as hosts for *Cx. pipiens* with Virginia opossum and domestic cat as the most common hosts in this class (each  $n = 6$ , 46.2% of mammalian hosts). There was no significant seasonal difference in the proportion of bloodmeals obtained from avian hosts, but there was a decrease in the proportion of bloodmeals from mammalian hosts from spring to fall. One engorged specimen of *Cx. pipiens* with Virginia opossum-derived bloodmeal tested positive for West Nile virus (WNV), and another with black-and-white warbler-derived bloodmeal tested positive for eastern equine encephalitis virus. Our findings, in conjunction with the results of vector competence studies and virus isolation from field-collected mosquitoes, lend additional support that *Cx. pipiens* serves as the principal enzootic vector and potential epizootic/epidemic vector of WNV in southeastern Virginia.

#### VALLEY LABORATORY

1. He, Jiao, De-Wei Li, Yu Zhang, Yun-Wei Ju, and Lin Huang. 2021. *Fusarium rosicola* sp. nov. causing vascular wilt on *Rosa chinensis* in China. *Plant Pathology* 70:2062-2073. <https://doi.org/10.1111/ppa.13452>

**Abstract:** Chinese rose (*Rosa chinensis*) is one of the most popular and widely cultivated flowers worldwide and has extremely high economic and ornamental value. In 2020 wilt disease on *R. chinensis* was discovered in Pukou District, Nanjing, Jiangsu Province, China. Fungal isolates were obtained from the stems of the rose. According to morphological characteristics and multilocus phylogenetic analyses with the sequences of the rDNA internal transcribed spacer (ITS), translation elongation factor 1- $\alpha$  gene (*TEF1-a*), and part of the RNA polymerase II gene (*RPB2*), the isolates YJ1 to YJ4 were determined as a new species of *Fusarium solani* species complex, and named as *Fusarium rosicola* sp. nov., which is hereby described and illustrated. Pathogenicity of the isolate YJ1 was verified by Koch's postulates. The fungus was determined as the pathogen causing rose vascular wilt. The isolate YJ1 was labelled with green fluorescent protein (GFP), and roots of *R. chinensis* were inoculated. The result showed that the fungus infected the vascular tissue of the host plants and caused withering of the above-ground parts, resulting in the death of the whole plant. The GFP-labelled pathogen was reisolated from the stems and foliage, proving that this is a newly emerged systemic disease on *R. chinensis* in the world.

2. Zhang, Kai, Weihua Guo, De-Wei Li, and Rafael F. Castañeda-Ruiz. 2021. *Vanakripa chinensis* sp. nov. from China and notes on the genus. *Mycotaxon* 136:545-551. <https://doi.org/10.5248/136.545>

**Abstract:** A new species *Vanakripa chinensis* found on decaying branches of an unidentified tree is described and illustrated. It is characterized by sporodochial conidiomata composed of macronematous, cylindrical conidiophores that are sometimes reduced to conidiogenous cells and obovoid, unicellular, brown, smooth conidia with a black spot near the middle. Notes on conidiogenous events in the genus *Vanakripa* and a key to the species are provided.

3. Qi, Xi-Ling, Jiao He, De-Wei Li, and Lin Huang. 2021. First report of leaf spot on *Elaeagnus pungens* caused by *Epicoccum latusicollum* in China. *Forest Pathology* 51(5): e12716. <https://doi.org/10.1111/efp.12716>

**Abstract:** *Elaeagnus pungens* is an ornamental plant used in landscapes and is native to China and Japan. In Nov. 2015, a leaf spot was found on *El. pungens* in the Sheshan National Forest Park located at Shanghai. A fungus was isolated from the margins of the lesions and one isolate, EP8, selected for identification and pathogenicity tests. Morphological characteristics of the fungus were similar to *Epicoccum latusicollum*. Phylogenetic analysis using concatenated sequences of ITS, LSU, TUB, and RPB2 also showed that isolate EP8 clustered with strains of *E. latusicollum*, a relationship supported with a high bootstrap value. This report is the first of *E. latusicollum* causing leaf spot on *El. pungens*.

4. LaMondia, James A., E. Allan-Perkins, and Srikanth Kodati. 2021. Factors affecting boxwood blight spread under landscape conditions. *Journal of Environmental Horticulture* 39:100-107.

**Abstract:** We investigated the spread of boxwood blight in a simulated landscape under conducive natural conditions from 2017 to 2019. We used strict sanitation to greatly reduce or eliminate spread by contact. Movement of the pathogen from an infected source plant was limited to one plant, likely spread by means of water splash. Plants were mulched with composted hardwood chips and mulching likely was primarily responsible for limiting spread to only the adjacent plant. Boxwood cultivar susceptibility and fungicide spray programs influenced the incidence of spread and severity of disease; in 2018 and 2019 the more susceptible cultivar had higher disease incidence and severity, respectively, than less susceptible cultivars. Fungicide application only had a small reduction in disease incidence in 2018. We also demonstrated that spores in clumps could survive extended dry conditions, indicating the importance of sanitation procedures on reducing spread. This experiment demonstrates that boxwood blight can be controlled in a landscape by following best management practices including cultural, sanitation, host susceptibility and fungicide application tactics.

5. Adesemoye, A., Z. H. Pervaiz, L. Parikh, Srikanth Kodati, Q. Zhang, S. Stepanović, and M. Saleem. 2021. Rhizobacterial, Fusarium complex, and fungicide seed treatments regulate shoot and root traits of soybean plants. *Journal of Soil Science and Plant Nutrition* 1-12. <https://doi.org/10.1007/s42729-021-00623-9>

**Abstract:** The effects of microbes and agrochemicals on crop plants are previously reported via seed treatments. We know little about the impacts of fungicides and microbial seed treatments on soybean shoot and root traits. We investigated the effects of separate consortia of two plant growth-promoting rhizobacteria (PGPR) such as *Bacillus simplex* R180 and *Burkholderia ambifaria* C628, two *Fusarium* species (*Fusarium oxysporum* and *Fusarium graminearum*), and Fungicides seed treatments on soybean traits. The PGPR and *Fusarium* increased

and reduced the root and shoot dry mass of soybean plants, respectively. *Fusarium* infected plants had a relatively higher trichome leaf density followed by the *PGPR*, *Control*, *Fungicide + PGPR*, and *Fungicides* treatments. The *PGPR* increased P contents, while *Fusarium* reduced Mg and Mn contents of soybean shoot tissues. The nutrient contents of large and fine roots also varied across the seed treatments. Overall, fine roots showed higher mineral contents than large roots. Soybean roots showed relatively higher mineral contents such as Mg, Zn, Ca, Mn, Cu, B, Fe, and Mo in the *fungicide + PGPR* and *fungicide* treatments. Root K contents were substantially higher in the microbial than chemical treatments. The reduced and increased trichome density as well as tissue P contents in response to the *Fungicides* and microbial (*PGPR*, *Fusarium*) treatments, respectively, suggest the negative and positive effects of fungicides and microbes on soybean root and shoot traits. In conclusion, chemicals, pathogenic and beneficial microbes may influence plant shoot and root traits that are important for plant growth and development.

## JOURNAL ARTICLES APPROVED OCTOBER 2021

Duan, J. J., R. Van Driesche, J. Schmude, R. Crandall, **Claire E. Rutledge**, N. Quinn, B. Slager, J. Gould, and J. Elkinton. Significant suppression of invasive emerald ash borer by introduced parasitoids: Potential for North American ash recovery. *Journal of Pest Science*.

**Hiskes, Rose**, and **Richard Cowles**. News letter alert - Updated pesticide guide for Connecticut Christmas tree growers available from The Connecticut Agricultural Experiment Station. *Treeline News Letter*.

Kong, M., J. Liang, C. Dai, **Jason C. White**, **Wade H. Elmer**, **Yi Wang**, X. Gao, and **Yu Shen**. Biochar nanoparticle-induced plant immunity and its application with the elicitor methoxyindole in *Nicotiana benthamiana*. *Environmental Science: Nano*.

**Li, Yonghao**. *Fusarium* wilt of tomato. *CAES Fact Sheet*.

Liu, J., X. Zhao, **Jason C. White**, F. Wu, and G. P. Gobb. Nanomaterials use in agriculture: Life cycle sustainability analysis. *Environmental Science and Technology*.

Magaña-López, E., V. Palos-Barba, R. Vázquez-Hernández, I. Torres-Pacheco, **Jason C. White**, R. Nava-Mendoza, and R. G. Guevara-González. Nanostructured mesoporous silica materials display eustressic effects on chili pepper (*Capsicum annuum* L.) grown under greenhouse conditions. *Heliyon*.

Shidore, T., **Nubia Zuverza-Mena**, **Jason C. White**, and **Washington da Silva**. Nano-enabled delivery of RNA molecules for prolonged anti-viral protection in crop plants. *ACS Applied Nano Materials*.

Wu, T., X. Liao, Y. Zou, K. Yang, **Jason C. White**, and D. Lin. Fe-based nanomaterial transformation to amorphous Fe: Enhanced alfalfa rhizoremediation of PCBs-contaminated soil. *Journal of Hazardous Materials*.

## NEW STAFF, STUDENTS, AND VOLUNTEERS OCTOBER 2021



**DR. MILICA PAVLIČEVIĆ** obtained her Master’s degree in Biochemistry from the Faculty of Chemistry, University of Belgrade (Serbia) and her Doctor of Science in Food Technology from the Faculty of Agriculture, University of Belgrade (Serbia). She is currently employed as a postdoctoral researcher at the Department of Chemistry, Life Sciences and Environmental Sustainability, University of Parma, Italy. As a part of the project “Go for IT,” which focuses on “sustainable biotechnological solutions for plant defense,” she will spend seven months at The Connecticut Agricultural Experiment Station (CAES). At CAES, she will attempt to determine the potential of two types of biochar: biochar produced by gasification from wood residue, and biochar produced by pyrolysis from wood residues, and two types of nanoparticles: chitosan-coated mesoporous silica nanoparticles, and nanoclays as delivery systems for nitrogen-fixating and phosphorus-solubilizing bacteria. Besides monitoring bacterial survival, she will also monitor: plant growth, nitrogen and phosphorus content as well as chlorophyll content, mitochondrial function, and formation of reactive oxygen species.



**DR. LEIGH WHITTINGHILL** joined the Department of Forestry and Horticulture on October 8, 2021. Leigh received her Ph.D. in Horticulture from Michigan State University in 2012. Her primary research focus there was on using green roof technology to produce food on rooftops and how that production might impact the benefits attributed to green roofs. She continued her research on a full-scale food producing green roof during a postdoctoral

position at The Earth Institute at Columbia University. There she worked with the Urban Design Laboratory and the Columbia Green Roof Consortium to conduct research examining stormwater runoff water quality and quantity from that farm and comparing to more typical ornamental green roofs. Dr. Whittinghill was Assistant Professor of Urban Agriculture at Kentucky State University from 2017 to 2021. Her research at Kentucky State University has continued to look at how nutrient management practices in urban growing systems, including green roofs and container and raised bed ground level systems, affect runoff water quality and yield. She has looked at some intensive growing practices, including succession planting and the use of repeated harvests from a single planting of greens. She has also included high value crops in her research, which can be used to help offset start up and production costs in urban agricultural systems. These have included greens, which also have a short growing period, and saffron. Dr. Whittinghill is planning to continue work on unconventional growing systems such as kiddie pool container gardens and nutrient management in urban systems.

**ERICA SELLERS** is a SCSU biology senior who is performing a fall semester internship focused on the microbiome and nutrient impact of protist inoculation on plants. She is working in Lindsay Triplett’s laboratory under the supervision of Dr. Stephen Taerum.



**JULIANA MILAGRES** is a student in Agronomy at the Universidade Federal de Viçosa (UFV) in Brazil who joined the da Silva Laboratory as an intern. Under the guidance of Dr. Washington da Silva, she will work on synthesizing dsRNA and siRNA molecules to protect potato plants against infections of potato virus Y (PVY).

**ALEXANDRA HAMZAIS** is a senior Science Research student at Manchester High School and will be pursuing a project in Dr. Blaire Steven’s laboratories. Her interest in the soil rhizosphere began when she learned about how microbes and plant roots communicate. The Australian wildfires then propelled her to look at how fire affects the soil microbiome. Now, working under Dr. Steven and Jacquelyn LaReau, she will be studying how *A. lipoferum* affects the corn soil microbiome after fire.





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## The Connecticut Agricultural Experiment Station

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