Station News

The Connecticut Agricultural Experiment Station
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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

This Issue

ADMINISTRATION

JASON C. WHITE, PH.D. along with **Drs. Nubia Zuverza-Mena, Sara Nason, and Jingyi Zhou** met by Zoom with collaborators at Yale University and the University of Minnesota to discuss progress on a collaborative NIEHS grant (July 1, 29); met by Teams with staff scientists at SWFT Labs to discuss collaborative projects (July 1, 25); hosted the quarterly CAES J-visa recipient meeting (July 2); along with **Chaoyi Deng, Ph.D. and Hina Ashraf, Ph.D.** participated in the weekly NSF Center for Sustainable Nanotechnology Zoom call (July 2, 9, 16, 23, 30); participated in a Teams Organization call for the America 250 - CT / Charter Oak Tree Planting (July 2); along with collaborators at the University of Minnesota met by Teams with CT Innovations to discuss nanotechnology and agriculture (July 2); met by Teams with staff at the CT Department of Consumer Protection (DCP) to discuss establishment of a Microbiology Reference Testing Laboratory at CAES (July 3, 8, 16, 22, 24); met with collaborators at the University of Minnesota and 3M to discuss a collaborative PFAS phytoremediation project (July 3); participated by Teams in the AgInnovation Multistate Activities Committee meeting (July 7); met by Teams with colleagues at Convergent Bioscience and the University of Minnesota (July 7, 16, 21, 23); gave a remote presentation entitled "Plastics in the Environment and Our Food: What is the Risk?" for the Plastic Free July, an event Sponsored by the Citizens Campaign for the Environment, The Nature Conservancy, and Save the Sound (July 8); met by Zoom with collaborators at the University of MN to discuss collaborative PFAS phytoremediation research project with 3M (July 8); along with **Sudhir Sharma, Ph.D.** met with colleagues at Columbia University to discuss collaborative research (July 15); participated by Teams in a meeting of the Board of the International Phytotechnologies Society to discuss the upcoming 2026 scientific meeting of the society (July 16); attended the 2025 Controlled Release Society Annual Meeting and Exposition in Philadelphia and gave a platform presentation entitled "Precision Agrochemical Delivery with Nanoscale Biopolymers" (July 13-18); met by Teams with colleagues at Convergent Bioscience and Yanmar industries to discuss nano-enabled agriculture research (July 21); participated in the 2025 USDA National Institute of Food and Agriculture Food Safety and Defense (A1332) annual Project Directors meeting on Zoom (July 23); met by Zoom with colleagues at Clemson University to discuss collaborative research (July 24); along with along with **Nubia Zuverza-Mena, Ph.D. and Mandeep Kaur, Ph.D.** travelled to Rutgers University to meet with colleagues there and from the New Jersey Institute of Technology on a joint USDA project focused on micro-nanoplastics toxicity (July 28); and was interviewed by Ed Ricciuti for a story about CAES at 150 years old for the CT Examiner (July 31).

PUBLICATIONS:

1. Pan, B., Hu, Y., Zhu, D., Oleszczuk, P., Driessche, A. E. S. V., Zhang, T., Zhang, Z., Liu, X., Peijnenburg, W., Xing, B., **White, J. C.** (2025). Environmental and Biogeochemical Processes. *Environmental and Biogeochemical Processes* 1: e001 doi: 10.48130/ebp-0025-0001.

Abstract: The inauguration of Environmental and Biogeochemical Processes coincides with a pivotal moment in Earth system science, as the international community grapples with interconnected crises of climate change, biodiversity loss, and biogeochemical cycle disruptions. With human activities intensifying global change, there is unprecedented urgency to understand the cycling of elements and compounds through terrestrial, aquatic, atmospheric, and biological systems. The current consensus is that environmental and biogeochemical processes are the core link connecting 'microbial activity' and 'macro Earth system', scientists should aim to achieve the ultimate goal of dual carbon plans, biodiversity conservation, and effectiveness of global environmental governance.

2. Pagano, L., Carlo, S., Lepore, G. O., Bnanni, V., Zizic, M., Pollastri, S., Margheri, S., Orsilli, J., Puri, A., Villani, M., Aquilanta, G., Gianoncelli, A., d'Acapito, F., Zappettini, A., **White, J. C.,** Marmiroli, N., Marmiroli, M. (2025). Mechanistic understanding of iron oxide nanobiotransformation in *Zea mays*: a combined synchrotron-based, physiological and molecular approach. *Environ. Sci.: Nano* 12:4107-4121.

Abstract: The study investigates the nanobiotransformation dynamics and molecular level impact of iron oxide nanoparticles (nFe3O4) on Zea mays. Specifically, the impact of soil-applied nFe3O4 (500 mg kg−1) or FeCl3 (75 mg kg−1) on Z. mays morphological, physiological, and transcriptional responses was investigated in a whole life cycle study. X-ray absorption spectroscopy (XAS) showed that the Fe local structure changed upon nanoscale Fe internalization, indicating potential nanoparticle biotransformation within the plant tissues. Neither of the Fe amendments induced significant plant morphological changes, although FeCl3 reduced chlorophyll content (SPAD index 37.43 vs. 44.33) and stomatal transpiration (s cm−1, 5.08 vs. 9.67) and increased lipid peroxidation (MDA content, µM, 7.01 vs. 3.26) compared with controls. Conversely, nFe3O4-treated plants exhibited milder physiological response as compared to FeCl3-treated plants (SPAD index: 40.42 vs. 37.43; MDA content: 4.57 vs. 7.01 µM). Gene expression of selected biomarkers showed a 2- to 4-fold increase of glutathione reductase (gsr1) and mate1 xylem transporter, and a 2-fold decrease of proline responding (pro1) gene. These findings, together with iron intake quantification, suggest limited internalization and translocation of iron in the pristine nanometric form and that Fe3+ internalization was a function of the amount in the medium. Importantly, nFe3O4 provided a controlled and more precise method of iron release in planta. The combination of physical, chemical, and biological data to assess the potential of nFe3O4 as a nanofertilizer leads to novel insights on the potential impact of nano-enabled agriculture and nanobiofortification.

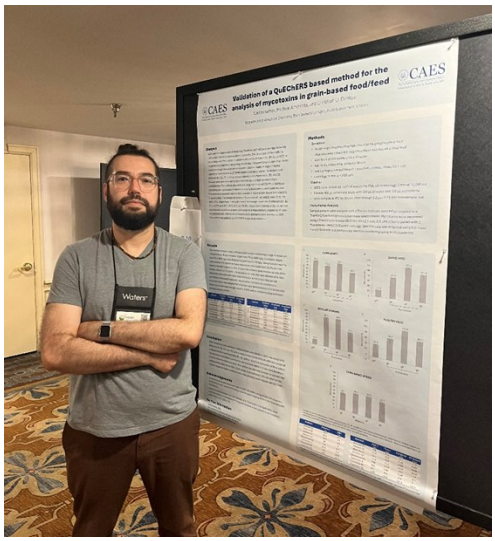
Drs. Jason C. White, Nubia Zuverza-Mena and **Mandeep Kaur** at Rutgers University.

Dr. Jason C. White and colleagues at the 2025 Controlled Release Society Annual Meeting and Exposition in Philadelphia.

ANALYTICAL CHEMISTRY

CHRISTIAN DIMKPA, PH.D. attended the 6th Biennial African Nano Conference and workshop at the University of Nigeria, Nsukka, Enugu State during July 13-19, 2025. He gave a keynote presentation titled "Role of nanotechnology in plant nutrient management for sustainable development**".** The conference was sponsored by the US NSF and had in attendance over 300 participants from Nigeria, the US, Ethiopia, South Africa, Kenya, the UK, and other countries.

RAJA MUTHURAMALINGAM, PH.D. participated in an online program, *Skype a Scientist*, with 1st–3rd grade students of Visitation School in Kansas City on July 24, 2025. He presented his research on nanotechnology in agriculture, and a total of 23 kids participated.



CARLOS TAMEZ, PH.D. attended the 61st annual North American Chemical Residue Workshop (NACRW) July 26–30 2025 in Charleston, SC. He presented a poster titled "Validation of a QuEChERS based method for the analysis of mycotoxins in grain-based food/feed".

NEW STAFF:

Felipe Franco de Oliveira, Ph.D. arrived at CAES in July 2025 and will spend one year conducting research in both the Department of Analytical Chemistry and the Department of Plant Pathology. He earned his B.S. in Agronomy from Mato Grosso State University in Brazil, and completed both his M.S. and Ph.D. in Plant Pathology at the University of Sao Paulo, with a focus on plant virology. He previously worked at CAES from summer 2022 to late spring 2023, when he studied how nanotechnology could improve the effectiveness of an insecticide used to control *Bemisia tabaci* (whitefly), a key vector of plant viruses. Now returning as a postdoctoral researcher, Dr. Oliveira is investigating how to combine RNA interference, a natural plant defense mechanism against viral diseases, with nanotechnology to develop an environmentally friendly strategy for managing plant pathogens.

Vanessa Takeshita, Ph.D. arrived at CAES in July 2025. She will conduct research at the Department of Analytical Chemistry for a year. She is an agronomist (Mato Grosso State University, Brazil, 2017) with a master's and doctorate in sciences, focusing on chemistry in agriculture and the environment (Center for Nuclear Energy in Agriculture, University of São Paulo, Brazil, 2019). She is currently a postdoctoral researcher (São Paulo State University) focused on developing a new nanoherbicide. At CAES, she will study the uptake, translocation, and efficacy of a new nanobioherbicide. In recent years, she has dedicated herself to tracking conventional and natural-based nanopesticides in plants and the environment to better understand interactions between nanoparticles, plants, and the environment. She has used a multi-technique approach, combining radioisotopes and microscopy, to screen these new formulations.

PUBLICATIONS:

1. Davidson, E., **Aikpokpodion, P.**, Pestereva, A., Pereira J., Diracca, Giullo, L., Allison, Tetard, L., **Dimkpa, C.,** Santra, S. (2025). Development of a nano sulfur-biopolymeric coating composite for rock phosphate: transforming a mineral into a fertilizer. *ACS Agricultural Science and Technology*. DOI: 10.1021/acsagscitech.5c00259.

Abstract: Securing global food supplies requires the use of fertilizers to sustain crop production. Current agricultural practices rely on the excessive use of phosphorus (P) fertilizers, which, unfortunately, have been implicated in surface and groundwater contamination due to their high solubility in water. This study aimed to develop a nanoenabled polymeric coating technology for pristine rock phosphate (RP) mineral. A chitosan gel matrix with tannic acid, citric acid, and nanosulfur (CTS) was designed to harness the chelating properties of organic acids and the abrasion resistance of sulfur to generate slow-release RP fertilizers. Furthermore, kinetic studies were conducted to provide insights into the surface interactions of the coatings and RP and the kinetics of phosphate desorption from the coated RP. The CTS-coated RP exhibited nonphytotoxicity, reduced P leaching, and increased plant height, plant biomass, and yield compared to a commercial P fertilizer. Loss of P from soil was reduced by 71% in CTS-coated RP treatment compared to the commercial P fertilizer application. In addition, there was a 12% enhancement in soil postharvest cation exchange capacity, corroborating the impact of the coating on the dissolution of cationic nutrients present in RP. The release kinetics elucidated a pseudo-first-order desorption process driving the available P release mechanism with a Pearson *R* correlation value of 0.983. Altogether, this study demonstrated the suitability of nanoenabled coating technology to develop an alternative for P fertilizers with improved P use efficiency, with benefits in sustainable crop production and reduced environmental impact.

ENTOMOLOGY

PHILIP ARMSTRONG, SC.D. was interviewed by Bloomberg City Lab about the mosquito surveillance program (July 3); interviewed by WICC about West Nile virus findings in Connecticut (July 8); participated in an online career workshop for the American Committee of Medical Entomology (July 10); met with Samantha Megwasser, an intern at the CT DPH, to discuss mosquito surveillance and research at the CAES (July 28).

ANGELA BRANSFIELD provided BSL-3 Laboratory training for two new personnel (July 3).

KELSEY E. FISHER, PH.D. met with the Terrestrial authorship team about a chapter for "United By Nature", a national knowledge assessment of nature and its benefits (formerly known as the National Nature Assessment) (July 11, 25); met Sarah Nason about collaborative opportunities (July 11); met and brainstormed with Erik Dopman (Tuffs University) and Brad Coates (USDA-ARS-CICGRU) about collaborative opportunities (July 15, 22, 31); discussed monarch butterfly conservation in New York City with Vox reporter Benji Jones (July 24).

ANDREA GLORIA-SORIA, PH.D. met with CT DPH intern Samantha Mergwasser on July 28 to discuss her research program on Population Genetics of mosquito vectors of disease.

MEGAN LINSKE, PH.D. met with CT DEEP Wildlife Division staff Tom Donlon and Keith Hoffman to discuss the development of a tick informational brochure tailored to the hunting community (July 8); participated in collaborative meetings with BanfieldBio, Inc. and North Carolina State University to review blacklegged tick repellency trials and the development and application of botanical acaricides (July 15 & 22); joined a progress call with staff from the Centers for Disease Control and Prevention's Division of Vector-Borne Diseases to review ongoing integrated tick management and seasonal spray initiatives (July 16); met with Samantah Megwasser, Connecticut Department of Public Health intern, to discuss current and upcoming integrated tick management research (July 29); met with Melissa George, Women and Family Life Center, to discuss programming and marketing strategies for the new *EmpowHer: Girls in STEM* initiative (July 30).

GOUDARZ MOLAEI, PH.D. was interviewed by WTNH Channel 8 and WFSB Channel 3 about longhorned tick activity at Pleasure Beach, Bridgeport, CT (July 2); met with Dr. Cecilia Sorensen, MD, director, Global Consortium on Climate and Health Education, and other faculty members at Columbia University, and with officials from the WHO EMRO region to plan a training course on climate change and public health (including vector-borne diseases) in 2026 (July 8); was interviewed by NBC News Climate Unit about the infection of the longhorned ticks with *Ehrlichia chaffeensis* (July 8); was interviewed by Connecticut Post about tick infestation at Pleasure Beach, Bridgeport, CT (July 10); visited Sheffield Island in Norwalk CT in response to a request by Norwalk health department to investigate the island for tick infestation and public health risk (July 11); met with Samantha Megwasser, an intern at the CT DPH, to discuss tick surveillance and research at the CAES Tick Testing Laboratory (July 28); and was interviewed by NBC national about the first evidence of infection of the longhorned ticks with *Ehrlichia chaffeensis* and its broader implication (July 28).

RAFFAELA NASTRI participated in the Connecticut Tree Protective Association summer meeting (July 17) to spread awareness about the invasive box tree moth and the CAPS program.

JOHN SHEPARD met with Samantha Megwasser, an intern fromCT DPH, to discuss the Mosquito Trapping and Arbovirus Surveillance Program (July 28).

GALE E. RIDGE, PH.D. was interviewed about bats eating spotted lanternflies and other native predators of the insect by Hurst Connecticut Media Group (July 1); interviewed about lightning bugs by Andrew DeRosa, Hurst Connecticut media Group (July 2); TEDEd released a six-minute educational video, "Why is it so hard to get rid of bed bugs?" (July 11); interviewed about Japanese beetle by Harlan Levy, Danbury Times (July 14); interviewed by Chaz and AJ 99.1WPLR on the New World Screwworm fly, *Cochliomyia hominivorax* which is moving north through Mexico and threatening the southern United States (July 16); interviewed about the spotted lanternfly in Connecticut by Aine Pennello, National Public Radio (July 23); interview and broadcast by Fox News 61 by Joe Monte about spotted lanternfly (July 24); interviewed by Melissa Cooney, NBC News about the spotted lanternfly; (July 24); interviewed by Katie Krajcik NBC social media about the spotted lanternfly (July25); interviewed by Andrew DeRosa, Hearst Connecticut Media Group about the spotted lanternfly (July 31). During July and part of August Logan Patria, senior forensic science student at the University of New Haven studied forensic entomology and fly development as an independent study under the guidance of Dr. Ridge. Nathan Havard and Bakary Santiago students from the Cedarhurst School Passage career program spent six weeks studying entomology and helped archive the insect collection under Dr. Ridge and Katherine Dugas.

PAULA WOLF joined the Massachusetts State Apiary Inspectors for a day of training inspecting bees during cranberry pollination (July 1); spoke to the UConn Master Gardeners as a Hot Topics speaker for their annual training (900 attendees, July 9); participated in the July session of the Connecticut Beekeepers Association's Bee Talks meeting, a monthly Q & A session for beekeepers discussing timely colony management issues (37 attendees, July 10); met with beekeepers attending CT DEEP's Bear Fence Workshop (31 attendees, July 13); met with beekeepers attending Eastern CT Beekeepers Association's Honey Workshop (July 13); participated in the Eastern Apicultural Society Conference in Cherry Hill, NJ, attending workshops and meeting with beekeepers at the Apiary Inspectors of America booth (July 27- August 1).

TRACY ZARRILLO filed a petition with CT-DEEP to list the rare bee species, *Macropis patellata,* as Endangered in Connecticut (July 17); published two fact sheets about specialist bees and the bees of Connecticut on the CAES Pollinator webpage (July 21); attended a Zoom meeting with Dr. Neil Cobb, Brianne DuClos, Sam Droege, and Codey Mathis to discuss an upcoming manuscript (July 21).

PUBLICATIONS:

1. Liang J., Rose N. H. , Brusentsov I. I, Lukyanchikova V., Karagodin D. A., Feng Y., Yurchenko A. A., Sharma A., Sylla M., Lutomiah J., Badolo A., Aribodor O., Gonzalez Acosta C., Alto B. W., Ahmad N. W., Baricheva E. M., Tu Z., Ayala D., **Gloria-Soria A.**, Black W. C., Powell J. R., Sharakhov I. V., McBride C. S., Sharakhova M. V. (2025). Chromosomal Inversions and Their Potential Impact on the Evolution of Arboviral Vector *Aedes aegypti*. *Genome Biology and Evolution*, Volume 17, Issue 7, evaf118, DOI: 10.1093/gbe/evaf118

Abstract: Chromosomal inversions play a crucial role in evolution and have been found to regulate epidemiologically significant traits in malaria mosquitoes. However, they have not been characterized in *Aedes aegypti*, the primary vector of arboviruses, due to the poor structure of its polytene chromosomes. The Hi-C proximity ligation approach was used to identify chromosomal inversions in 25 strains of *A. aegypti* obtained from its worldwide distribution and in one strain of *Aedes mascarensis*. The study identified 21 multimegabase polymorphic inversions ranging in size from 5 to 55 Mbp. Inversions were more abundant in African than

in non-African strains, 15 versus 3 inversions, with the highest number observed in West Africa. All inversions were grouped into two geographic clusters of African or non-African origin, suggesting their association with *A. aegypti* subspecies. Inversions were unevenly distributed along chromosomal arms, with the highest number found in the 1q and 3p arms homologous to the inversion-rich 2R chromosomal arm in the malaria vector *Anopheles gambiae*. Direct comparison of inversions between *A. aegypti* and *An. gambiae* revealed significant overlap in their genomic locations. This finding may explain the parallel evolution of the two species under similar environmental conditions. Some of the inversions colocalized with chemoreceptor genes and quantitative trait loci associated with pathogen infection, suggesting their potential role in host preference and disease transmission. Our study revealed the large pool of structural variations in the *A. aegypti* genome and provides the foundation for future studies of their impact on the biology of this important arboviral vector.

2. Mulwa, F., Balcazar, D., Langat, S., Mutisya, J., Chelangat, B., McBride, C. S., Rose, N., Powell, J., Sang, R., Bastos, A. and **Gloria-Soria, A**. (2025). Population genetic analysis of *Aedes aegypti* reveals evidence of emerging admixture populations in coastal Kenya. *PLOS Neglected Tropical Diseases*, *19*(5), p.e0013041. DOI: 10.1371/journal.pntd.0013041

Background
The *Aedes aegypti* mosquito is widespread in tropical and subtropical regions. There are two recognized subspecies; the invasive *Aedes aegypti aegypti* (*Aaa*) and the ancestral *Aedes aegypti formosus* (*Aaf*). *Aaf* is common throughout Kenya whereas *Aaa*, which was historically confined to coastal regions, has undergone a range expansion. In areas of sympatry, gene flow may lead to admixed populations with potential differences in vectorial capacity. We hypothesize that coastal *Ae. aegypti* populations have a higher proportion of *Aaa* ancestry than those from inland locations of Kenya, influenced by their distance to the coast.
Methodology
Adult *Ae. aegypti* mosquitoes were collected using Biogent (BG) sentinel traps baited with carbon-dioxide (CO_2) from cities and towns along the Kenyan northern transport corridor. *Aedes aegypti* population structure, genetic diversity, and isolation by distance were analyzed using genome-wide single nucleotide polymorphism (SNPs) datasets generated with an *Ae. aegypti* microarray chip targeting ≈50,000 SNPs. Kenyan *Aedes aegypti* populations were placed into a global context within a phylogenetic tree, by combining the Kenyan dataset with a previously published global database.
Results
A total of 67 *Ae. aegypti* mosquitoes population from Kenya were genotyped, we found that western Kenya *Ae. aegypti* constitute a genetically homogenous population that clusters with African *Aaf*, whereas coastal mosquitoes showed evidence of admixture between the two subspecies. There was a positive correlation (Observation = 0.869, p = 0.0023) between genetic distance (FST) and geographic distance, suggesting isolation by distance. The phylogenetic analysis and the genetic structure analysis suggest that an Asian Aaa population is the source of Aaa invasion into Kenya.

3. Johnson, R. M., Breban, M. I., Nolan, B. L., Sodeinde, A., Ott, I. O., Ross, P. A., Gu, X., Grubaugh, N. D., Perkins, A. T., **Brackney, D. E.**, Vogels, C. B. F. (2025). Implications of successive blood feeding on *Wolbachia*-mediated dengue virus inhibition in *Aedes aegypti* mosquitoes. *Nat Comm.*, *16*, 6971. DOI: 10.1038/s41467-025-62352-2

Abstract: *Wolbachia* is a promising strategy to inhibit dengue virus (DENV) transmission by *Ae. aegypti* mosquitoes. Laboratory studies assessing DENV inhibition by *Wolbachia* typically have not considered natural frequent mosquito blood feeding behavior. Here, we determined the impact of successive feeding on DENV-2 transmission by *Ae. aegypti* in the presence or absence of *Wolbachia* (*w*AlbB and *w*MelM strains). We found that successive feeding short-

ens the extrinsic incubation period (EIP) in wildtype (WT; without *Wolbachia*) and *w*AlbB mosquitoes through enhanced dissemination. Feeding empirical data into models showed that successive feeding increased the probability of WT and *w*AlbB mosquitoes surviving beyond the EIP. Importantly, the more epidemiologically relevant comparison of the odds of *w*AlbB mosquitoes surviving beyond the EIP relative to WT, revealed a larger impact of successive feeding on WT than *w*AlbB. This indicates a strong inhibitory effect of *Wolbachia* even in the context of natural frequent mosquito blood feeding behavior.

4. Hall, D. R., **Johnson, R. M.**, Kwon, H., **Ferdous, Z.**, Laredo-Tiscareno, S. V., Blitvich, B. J., **Brackney D. E.,** Smith, R. C. (2025). Mosquito immune cells enhance dengue and Zika virus infection in *Aedes aegypti*. *Nat. Comm., 16*(1), 5891. DOI: 10.1038/s41467-025-61139-9

Abstract: Mosquito-borne arboviruses cause more than 400 million annual infections, yet despite their public health importance, the mechanisms by which arboviruses infect and disseminate in the mosquito host are not well understood. Here, we provide evidence that dengue virus and Zika virus actively infect *Aedes aegypti* hemocytes and demonstrate, through phagocyte depletion, that hemocytes facilitate virus infection to peripheral tissues including the ovaries and salivary glands. Adoptive transfer experiments further reveal that virus-infected hemocytes efficiently confer virus infection to recipient naïve mosquitoes. Together, these data support a model of arbovirus dissemination where infected hemocytes enhance virus infection of mosquito tissues required for transmission, which parallels vertebrate systems where immune cell populations promote virus dissemination. This study significantly advances our understanding of virus infection dynamics in the mosquito host and highlights potential conserved roles of immune cells in arbovirus infection across vertebrate and invertebrate systems.

Insect collection interns and forensic entomology researcher. From left to right.

Dr. Ridge, Nathan Havard and Bakary Santiago students from Cedarhurst School Passage career program (studied entomology and interned in the insect collection), Katherine Dugas, and Logan Patria (senior forensic science student at the University of New Haven who completed an independent study in Forensic Entomology).

ENVIRONMENTAL SCIENCE & FORESTRY

SCOTT C. WILLIAMS, PH.D. participated in a meeting with staff from BanfieldBio, Inc. on a collaborative CDC grant investigating botanical extracts in their potential to manage ticks in peridomestic habitats (July 1); hosted a meeting with staff from USDA and White Buffalo, Inc. on host-targeted blacklegged tick management (July 2); interview with Killingworth outdoor writer Ed Ricciuti about tick research and CAES was published in Pest Control Technology Magazine (July 3); participated in a meeting with BanfieldBio on a collaborative NIH SBIR grant investigating tick repellent formulations to be integrated into fabrics (July 8); with **Megan Linske, Ph.D.**, **Jessica Brown, Ph.D.**, and **Natalie Bailey**, met with CT DEEP Wildlife Division staff Tom Donlon and Keith Hoffman about creating a tick informational brochure geared toward the hunting community (July 8); as vice-Chair, participated in an evening meeting for the Town of Guilford Inland Wetlands Commission (July 9); interviewed by Jed Kim of National Public Radio about tick and tick-borne disease ecology as a function of acorn abundance (July 11); interviewed by Connecticut Public Radio's Macy Hanzlik-Barend about tick abundance this year for an article titled "Tick incidents increase throughout the Northeast, but CT health officials say they're prepared" that appeared in New Hampshire Public Radio and the Connecticut Mirror (July 15); participated in a meeting with staff from BanfieldBio, Inc. on a collaborative CDC grant investigating botanical extracts in their potential to manage ticks in peridomestic habitats (July 15); participated in the meeting of the State of Connecticut Management Advisory Council (July 16); participated in a meeting with staff from the CDC Division of Vector-Borne Diseases on ongoing progress made on a funded integrated tick management project (July 16); participated in a meeting with BanfieldBio on a collaborative NIH SBIR grant investigating tick repellent formulations to be integrated into fabrics (July 22); interviewed by Sue Braden from the Shoreline Times/New Haven Register on the ecological importance of the East River Preserve expansion (20-acre acquisition) by the Town of Guilford in terms of habitat and a changing climate (July 22); as a seated commissioner, participated in the monthly evening meeting of the Town of Guilford Conservation Commission (July 23); met with CT Department of Public Health intern Samantha Megwasser to discuss our work on tick ecology and integrated tick management (July 28).

NATALIE BAILEY participated in a Zoom call with BanfieldBio to discuss the development of a botanical acaricide (July 1, 15); participated in a collaborative Zoom call with members of the Banfield Biologic NIH SBIR-funded tick repellent fabric team (July 8, 22); overnighted at the Yale Peabody Museum's Field Station on Horse Island in Branford's Thimble Islands Archipelago to assess small mammal abundance and American dog tick (*Dermacentor variabilis*) host ecology (July 9 – July 10).

JOSEPH P. BARSKY participated in the Society of American Foresters National Convention local coordinators meeting (July 10); attended the 2024 Monitoring Report for the Forest Ecosystem Monitoring Cooperative (July 14).

JESSICA E. BROWN, PH.D. overnighted at the Yale Peabody Museum's Field Station on Horse Island in Branford's Thimble Islands Archipelago to assess small mammal abundance and American dog tick (*Dermacentor variabilis*) host ecology (July 9 – July 10); as a current student, participated in a meeting with The Wildlife Society's Leadership Institute group to talk with alumni of the program (July 11).

GREGORY J. BUGBEE gave invited talk "Connecticut River Hydrilla: The Spread Continues" at the Aquatic Plant Society Meetings in Providence Rhode Island (75 attendees) (July 15); gave invited talk "Bashan Lake Aquatic Plant Update" to the Bashan Lake Association at the East Haddam Grange (50 attendees) (July 23); spoke at a press conference hosted by Sena-

tor Richard Blumenthal on hydrilla in the Connecticut River (July 18); interviewed on "Hydrilla in the Connecticut River" by Annabel Hofmann CT Examiner (July 9), Luke Hajdasz WFSB TV3 (July 18), Brian Smith CT Examiner (July 18), Brian and Company WTIC (July 23), Reese in the Afternoon WTIC (July 23, July 24), Brian Smith podcast (July 28), and Ed Mahoney Hartford Courant (July 30); provided guidance at United States Army Corps of Engineers CT River hydrilla demonstration project workgroup meetings (July 2, 10, 23,30).

JEREMIAH R. FOLEY, IV, PH.D. attended weekly virtual meetings with the U.S. Army Corps of Engineers as part of the Connecticut River Hydrilla Demonstration Project; interviewed by the CT Mirror regarding the use of aquatic herbicides, highlighting the science behind the treatments and the management challenges posed by invasive plants (July 3); interviewed by the CT Examiner about public concerns over diquat use in hydrilla control, responding to viral claims and emphasizing the importance of scientific evidence and regulatory oversight (July 11); attended the National Aquatic Plant Management Society conference in Providence, RI and delivered one of four open plenary talks during the conference's opening session titled "The Potential for Classical Biological Control of CT River Hydrilla" (July 14); co-authored three posters: "Field Based Monitoring of *Hydrilla verticillata* subsp. *lithuanica* Removal Impacts on Carbon Dynamics in the Lower Connecticut River," "Effect of Chilling Duration on Sprouting of Connecticut River Hydrilla Turions," and "Detecting Northern Hydrilla (*Hydrilla verticillata* subsp. *lithuanica*) in the Connecticut River with Satellite Imagery" (July 14–17); met with collaborators from the U.S. Army Corps of Engineers, Engineer Research and Development Center and the University of Florida Center for Aquatic Invasive Plants to coordinate research on New England native species' response to aquatic herbicides (July 31); research highlighted in a national article highlighting the collaboration between Weed Science Society of America and Aquatic Plant Management Society leadership to address invasive hydrilla in the Connecticut River (July 31).

SUSANNA KERIÖ, D.SC. presented an invited talk at the Connecticut Tree Protective Association's summer meeting titled "Drought and Tree Health" (300 attendees) (July 17).

SARA NASON, PH.D., as chair, led a virtual meeting for the Best Practices for Non-Targeted Analysis working group (July 1); met virtually with colleagues and students from the University of Minnesota (Dr. Christy Haynes, Riley Lewis, and Cheng-Hsin Huang) and CAES (**JASON WHITE, PH.D., Nubia Zuverza-Mena, Ph.D., Jingyi Zhou, Ph.D.**) to discuss an ongoing funded collaboration on nanomaterial enhancement of PFAS phytoremediation (July 1, 30); organized a group visit to the CT Department of Public Health Laboratory attended by **Carlos Tamez, Ph.D., Anuja Bharadwaj, Ph.D., Terri Arsenault, Jasmine Jones, Jingyi Zhou, Ph.D., Gustavo Garcia, Ph.D., Priyankar Chand, Ph.D., Raees Ahmad, Ph.D.,** and **Fedelia Asante,** and toured the facility with Dr. Susan Isch and George Garrison (July 16); met virtually with Bryan Berger and Michael Timko (University of Virginia), Fred Corey (Mi'kmaq Nation), Chelli Stanley (Upland Grassroots, and Katie Richards (Maine PFAS Labs), and others to discuss progress on our EPA funded research (July 18).

ITAMAR SHABTAI, PH.D. attended the 2025 Goldschmidt Meeting of the Geochemical Society in Prague, Czech Republic (July 7-10) and gave an oral presentation titled: Exploring the Role of Root Exudates in the Formation and Disruption of Organo-mineral Associations in the Rhizosphere (100 attendees) (July 9); met with a colleague from the University of Zurich to discuss a collaborative opinion paper (July 10); met with colleagues at the Technical University of Munich, in Freising, Germany, to discuss collaborations on NSF-BSF grant proposals (July 11); met with colleagues from Cornell University to discuss an ongoing collaborative project (June 14); met with colleagues from Purdue University to discuss a grant proposal to Foundation for Food and Agriculture Research Growing Impacts program (July 18); met with a colleague from Yale University to discuss collaboration on a United States- Israel Bi-

national Agricultural Research and Development Fund grant proposal (July 25).

BLAIRE STEVEN, PH.D. attended the Applied and Environmental Microbiology GRC conference at Mount Holyoke College in South Hadley, MA and presented a poster entitled "Nanopore Adaptive Sequencing Recovers Full Bacterial Genomes from the Mosquito Microbiome" (July 13-17); promoted to a Senior Editor position at the American Society of Microbiology journal Microbiology Spectrum (https://journals.asm.org/journal/spectrum/board-editors) (July 30).

ELISABETH WARD, PH.D. met with Marlyse Duguid, Ph.D., (The Forest School, Yale School of the Environment) and her interns to discuss beech leaf disease management project in New Haven parks (July 7); met with Alison Adams, Ph.D., (Forest Ecosystem Monitoring Cooperative), Anna Yang, Ph.D. (USDA Forest Service), and Elena Karlsen-Ayala, Ph.D., (USDA Forest Service) to work on oak wilt risk map for Connecticut (July 8); met with Jonathan Rosenthal and Radka Wildova, Ph.D., (Ecological Research Institute) along with **Jack Hatajik** to discuss project locating lingering ash populations in Connecticut (July 10); participated on a panel about federal job opportunities for the Plant Health Fellows program (July 14); met with Josh Halsey and Jessie McSwane from the Peconic Land Trust to discuss beech stand management to improve forest health on their Long Island properties (July 25).

JEFFREY S. WARD, PH.D. was featured in Northern Woodlands' Community Voices (Multigenerational Forestry with Jeff Ward); participated in Society of American Foresters' 2025 national convention field tours planning meeting (July 21); spoke on "Tending Young Oak Stands" at the Northeast Silviculture Institute for Foresters' Oak-Pine Module hosted by the University of New Hampshire – Cooperative Extension in Concord, NH (38 attendees) (July 30).

MADELINE WATTS attended the US Army Corps' Connecticut River Hydrilla Demonstration Project meetings (July 2, 23, 30); met in the field with CT DEEP Natural Diversity Data Base staff to identify threatened and endangered aquatic plant species to be studied prior to hydrilla treatment (July 11); attended the national Aquatic Plant Management Society conference in Providence, Rhode Island, where she presented two posters titled "Field-Based Monitoring of *Hydrilla verticillata* subsp. *lithuanica* Removal Impacts on Carbon Dynamics in the Lower Connecticut River" and "Effect of Chilling Duration on Sprouting of Connecticut River Hydrilla Turions" (July 14–17); met with collaborators from the U.S. Army Corps of Engineers Research and Development Center and the University of Florida Center for Aquatic Invasive Plants to coordinate research on New England native species' response to aquatic herbicides (July 31).

SUMMER WEIDMAN presented an aquatic plant workshop to the Town of Ledyard Day Camp (25 attendees) (July 3); presented a poster titled "Detecting Northern Hydrilla (*Hydrilla verticillata* ssp. *lithuanica*) in the Connecticut River with Satellite Imagery" at the Aquatic Plant Management Society annual conference in Providence, RI (July 15-17); gave an aquatic plant workshop to the Four Oakes Day Camp in Redding, CT (15 attendees) (July 24); participated in the Northeast Aquatic Plant Management Society virtual scholarship committee meeting (July 28); participated in virtual meetings with the US Army Corps of Engineers to discuss CT River Hydrilla (July 23, 30).

LEIGH J. WHITTINGHILL, PH.D. and **Itamar Shabtai, Ph.D.** met with Drs Baikun Li, Xingyu Wang, and Yu Lei from the School of Civil and Environmental Engineering at the University of Connecticut, discuss their in situ soil nutrient sensors and possible collaborations (July 3); with interns **Kate Bruno**, **Lauren Crawford**, and **Riley Eagleson** met with Stephen

Cremin-Endes, Director, Community Building and Organizing NHS New Haven, Dr. Stacy Maddern, UConn, and other community partners at the Ivy Street Community Garden to view the new Street Garden in stellation and discuss additional networking and collaboration (July 18).

YINGXUE (CHARLIE) YU, PH.D. met with collaborators from EMSL to discuss nano-plastic quantification with Py-GC/MS (July 21).

JING YUAN, PH.D. attended the Applied and Environmental Microbiology Gordon Research Seminar (July 12–13); attended the Gordon Research Conference at Mount Holyoke College, served as discussion leader at the session "Microbes as Ecosystem Engineers: Unraveling the Microbial Role in Ecosystem Function," and presented a research poster titled "Non-Linear Response in Microbiome Structure and Soil Respiration Along a Gradient of Soil Water-Filled Pore Space" (July 13–18).

PUBLICATIONS:

1. Ward, E. B. and Bradford, M. A. (2025). Plant nitrogen demand, not soil carbon availability, decouples net mineralization and nitrification following forest canopy disturbances. *Biogeochemistry Letters*. DOI: 10.1007/s10533-025-01251-6

Abstract: Nitrification is a key biogeochemical process, with higher rates indicative of higher soil nitrogen availability and potential nitrogen losses from soils to waterways and the atmosphere. Heterotrophic microbes and plants compete with nitrifiers for mineralized nitrogen, thereby influencing the fraction of ammonium converted by nitrifiers to nitrate. Higher soil carbon availability fuels heterotrophic microbial ammonium demand, which can weaken the positive relationship between net nitrogen mineralization and nitrification by limiting ammonium supply to nitrifiers. Whether soil carbon availability remains a central control on the coupling of these processes under altered plant nitrogen demand remains relatively unexplored even as disturbances that reduce plant biomass increase globally. Using partially disturbed forests that vary in aboveground biomass and soil carbon availability, we test the generalizability of microbially available carbon as a control on the coupling of net nitrogen mineralization and nitrification. We analyze differences between harvested and unharvested forest stands, changes over time since harvest, and the effects of retained overstory trees. Higher levels of disturbance consistently strengthened the positive relationship between net nitrogen mineralization and nitrification. Yet reduced plant biomass, rather than microbially available carbon, primarily mediated the coupling of these processes. Our findings suggest that plant-mediated nitrogen demand can be a stronger control on the decoupling of nitrogen mineralization and nitrification than heterotrophic soil microbes following partial canopy disturbances. These results have important implications for understanding coupled carbon and nitrogen cycling processes in forests globally, highlighting a need to consider how shifting disturbance regimes could influence controls on nitrification.

GRANTS/AWARDS:

ELISABETH WARD, PH.D. and **SUSANNA KERIÖ, D.SC.** are co-PIs on a project titled "Monitoring non-structural carbohydrates in American Beech (*Fagus grandifolia*) in response to beech leaf disease at Great Mountain Forest and across New England" funded for **$19,500** through the Taylor Fellowship at The Forest School (TFS) at the Yale School of the Environment (YSE) along with Jonathan Gerwirtzman (PI, Yale), Helen Poulos, Ph.D. (Wesleyan University), and Craig Brodersen, Ph.D. (Yale).

ELISABETH WARD, PH.D. received **$10,000** from the Forest Ecosystem Monitoring Cooperative at the University of Vermont to support regional forest health monitoring and to serve as the Connecticut State Coordinator for the Cooperative in 2025.

ELISABETH WARD, PH.D. received **$91,460** from the USDA Forest Service Cooperative Forest Health Protection Program to monitor and survey forest health conditions in Connecticut.

SUMMER WEIDMAN received grant funding from the United States Fish and Wildlife Service to perform a "Comparative Analysis of AIS Mapping Techniques on Seasonal Abundance and Distribution of *Hydrilla verticillata* ssp. *lithuanica* at Connecticut River Boat Ramps." **$49,110.39**

SHAIK (BAKSHI) ALLABAKSHI, PH.D. doctoral thesis titled "Development of an Atmospheric Pressure Photo Plasma Reactor for Efficient Treatment of Industrial Wastewater" was recently selected for the First Dean's Prize for the best Ph.D. thesis at the Indian Institute of Technology Tirupati. Bakshi recently traveled back to India to receive this prestigious award from his alma mater. If you see Bakshi around the campus, be sure to congratulate him!

LOCAL RESEARCH UPDATE:

ESF Postdoctoral Scientist **JESSICA BROWN, PH.D.** and ESF Technician **NATALIE BAILEY** recently spent the night at the Yale University's Peabody Museum field station on Horse Island in Branford's Thimbles in a collaborative effort with Dr. Nicole Palffy-Muhoray and Dr. Natalie Mastick (Peabody Museum) to assess the ecology and manage an impressive infestation of American dog tick (*Dermacentor variabilis*). During a preliminary visit to Horse Island in May, the Williams/Linske team deployed rodent-targeted systemic acaricide baits, set trail cameras, and established a baseline density of adult ticks via drag sampling.

While blacklegged tick (*Ixodes scapularis*) and longhorned tick (*Haemaphysalis longicornis*) were documented, the dominant species present by far was American dog tick. In May, the average sampled density was 11 adult ticks/100 m^2, by July, this increased to an average of 27/100 m^2. Ninety Sherman traps captured only three white-footed mice (*Peromyscus leucopus*), but trail cameras documented presence of meadow vole (*Microtus pennsylvanicus*), another common rodent species pivotal for tick reproductive success. Cameras also captured a variety of non-target species on the island, including raccoon (*Procyon lotor*), American mink (*Neogale vison*), eastern towhee (*Pipilo erythrophthalmus*), mallard (*Anas platyrhynchos*), fish crow (*Corvus ossifragus*), common yellowthroat (*Geophysics trichas*), among others. Because little is known about the resident fauna of Horse Island, a comprehensive species list was compiled and added to records retained by the Yale Peabody Museum. The team plans to continue this collaborative effort to determine the efficacy of tick treatments and the primary drivers of the remarkably high tick population over time.

Impressive haul of over 60 American dogs ticks in 100 square meter drag sample.

JESSICA BROWN, PH.D. evaluating a captured white-footed mouse (*Peromyscus leucopus*) for juvenile tick parasitism.

NATALIE BAILEY installing a rodent box containing an experimental, orally delivered systemic acaricide rodent bait to manage parasitizing juvenile ticks on small rodents.

Sherman live traps baited and ready to be deployed overnight to document small rodent diversity and abundance on Horse Island.

ESF Postdoctoral Scientist **JING YUAN, PH.D.** moderated a session titled "Microbes as Ecosystem Engineers: Unraveling the Microbial Role in Ecosystem Function" at the Gordon Research Conference at Mount Holyoke College.

ESF Postdoctoral Scientist **SHAIK (BAKSHI) ALLABAKSHI, PH.D.** receiving the First Dean's Prize for the best Ph.D. thesis at the Indian Institute of Technology Tirupati.

CAES participants (Back row left to right: **JASMINE JONES, PRIYANKAR CHAND, ANUJA BHARADWAJ, RAEES AHMAD, CARLOS TAMEZ, SARA NASON, GUSTAVO GARCIA**. Seated left to right: **FEDELIA ASANTE, JINGYI ZHOU, TERRI ARSENAULT**) attending a tour of the CT Department of Public Health Laboratory in Rocky Hill, CT (July 16).

PLANT PATHOLOGY AND ECOLOGY

LINDSAY TRIPLETT, PH.D. participated in a grant panel for a federal funding agency, participated in a meeting of the Academic Unit Leaders Forum of APS, and hosted Drs. Lucy Moleleke (FABI Pretoria) and Roy Davis (UCONN) for campus visits and tours (July 7 and 8, respectively). For the Plant Health Fellows USDA-REEU internship program enrichment activities, she led a science communication workshop (July 7), a symposium practice session (July 21), a data analysis session (July 28), and career panels featuring early career academics and industry and federal research scientists in plant health (UCONN and Yale July 7, Biosafe Systems, EcoTech, and Bayer, July 21, and EPA, NRCS, and BLM, July 14, all with 9 attendees).

YONGHAO LI, PH.D. staffed CAES booth at the CTPA Summer Meeting (July 17); presented "Organic Gardening" to Enfield Garden Club (July 23, 33 adults); presented "Backyard Composting" for the Cromwell Senior Center education program (July 29, 14 adults).

ROBERT MARRA, PH.D. participated in the monthly meeting of Divisional Forum Representatives of the American Phytopathological Society, via Zoom (9 adults)(July 29); fielded six phone calls from citizens regarding beech leaf disease and treatment options.

FELICIA MILLETT was interviewed by Jayden Nguyen of CT Insider (July 2); staffed the CAES table at the CTPA Summer Meeting (July 17); and presented "Native Plant Gardening in Connecticut" to the Oxford Garden Club (14 adults) (July 22).

MONIQUE RODRIGUES E SILVA, from **Raquel Rocha, Ph.D.**'s lab, presented her research conducted at CAES titled "Temperature Impacts on the Life Cycle of Two Root-Knot Nematode Species" at the 64th Annual Meeting of the Society of Nematologists in British Columbia, Canada (July 13th, 150 adults). She was also honored with the Bayer Crop Science Graduate Student Travel Award, enabling her to attend and present her work at the conference.

WASHINGTON DA SILVA, PH.D. participated, as the scientific member, in the Connecticut Farm Wine Development Council Meeting via Zoom (10 attendees) (July 3rd); served as co-advisor for Ms. Tatianne Raianne Costa Alves's doctoral dissertation defense, her thesis is entitled "Mitigating Root Rot in Melon Monoculture: Investigating Soil Microbiome Dynamics and the Efficacy of Microbial and Metabolite Amendments in Disease Management" (July 22nd, 20 adults, via Google Meetings).

QUAN ZENG, PH.D. met Dr. Lucy Moleleki from the University of Pretoria and discussed mutual research interests (July 8th), presented two posters "Identification of yeasts from the apple flower microbiome that induces systemic aquired resistance in apple" and "Glandular and non-glandular trichomes as entry points of fire blight pathogen *Erwinia amylovora* into apple shoots" at the I-MPMI Conference in Cologne, Germany (July 14, 100 adults).

PUBLICATIONS:

1. Barroso, K., Milagres, J., Tracton, T., Shidore, T., **Muthuramalingam, R.**, El-Tanbouly, R., Ambrósio, M., and **da Silva, W**. (2025). The genomic region matters when synthesizing dsRNA for plant virus suppression via RNAi. *Nature Spring - Virology Journal*. DOI: 10.1186/s12985-025-02709-7

Abstract: Plant viruses are one of the most economically important plant pathogen groups in the world, and there is no viricide available for their control. Therefore, RNA interference (RNAi)-based crop protection has become a promising strategy for the control of viral plant

pathogens in agricultural systems. Herein, we aimed to test the hypothesis that exogenously applied dsRNA molecules derived from different viral genomic regions induce different levels of viral suppression by RNAi in plants. We also evaluated the fate and movement of the dsRNA molecules inside tobacco plants. We synthesized dsRNAs from three potato virus Y (PVY) cistrons, helper component-protease (HC-Pro), nuclear inclusion protein b (NIb), and coat protein (CP), and applied them to tobacco leaves to test our hypothesis. Our results indicated that all three dsRNAs applied can provide some level of protection to plants against PVY infection. However, the intensity and longevity of protection depend on the type of dsRNA applied. HC-Pro-dsRNA induced greater protection, entered, and moved faster in tobacco plants than dsRNAs from NIb and CP cistrons. Furthermore, dsRNAs were detected in systemic leaves after 24 h of dsRNA application and remained for at least 14 days, demonstrating that these molecules translocated systemically inside the plant. The synthesis and application of exogenous dsRNAs targeting the HC-Pro genomic region of PVY appear to be a promising strategy for controlling PVY. Moving forward, we are working on developing a delivery system to sustainably provide plants with those molecules to create viricides for practical agricultural applications.

2. de Moura, A. P., **Santos Silva, J. L.**, Silva Ribeiro, J. W., **da Silva, W.**, and Ambrósio, M. (2025). Colletotrichum brevisporum and Colletotrichum truncatum cause pumpkin anthracnose in Brazil. *Crop Protection*. DOI: 10.1016/j.cropro.2025.107335

Abstract: This study aimed to identify and characterize Colletotrichum species causing fruit rot in pumpkins (Cucurbita moschata Duch. Ex Poir.) in Brazil. Symptomatic pumpkins showing necrotic spots were collected from five farms in Rio Grande do Norte state, where growers reported disease incidence affecting approximately 30 % of fruits during the rainy season. The isolates were identified through morphological features and partial sequencing of the ITS, ACT, GAPDH, and CHS-1 genomic regions. Two species, Colletotrichum brevisporum (three isolates) and Colletotrichum truncatum (five isolates), were identified. Pathogenicity tests confirmed both species cause anthracnose in pumpkins and Koch's postulates were fulfilled. To the best of our knowledge, this is the first report of C. brevisporum and C. truncatum causing anthracnose in pumpkins in Brazil. These findings provide valuable information for understanding the Colletotrichum-pumpkin pathosystem and developing effective disease management strategies.

3. Costa, T. E., Borges, D., Dumas, M., Bendett, C., Santos Araújo Holanda, I., Nunes, G., Alves, H., Ambrósio, M., and **da Silva, W.** (2025). First report of grapevine red blotch virus causing grapevine red blotch disease in New England vineyards. *Plant Disease*. DOI: 10.1094/PDIS-04-25-0733-PDN

Abstract: Grapevine red blotch virus (GRBV) causes grapevine red blotch disease, impacting grape production and quality. While previously reported in many US grape-producing states, GRBV hadn't been found in the Southeastern New England American Viticultural Area (SNEAVA). However, a survey from 2018-2020 in SNE-AVA vineyards revealed 28 leaf samples from five vineyards (Connecticut, Massachusetts, and Rhode Island) showing symptoms similar to leafroll disease that tested negative for common RNA viruses. Further analysis using next-generation sequencing and PCR confirmed the presence of GRBV in 18 of these samples. Whole or partial genome sequences were obtained from these isolates, which grouped into two distinct phylogenetic clades. This study marks the first reported detection of GRBV in SNE-AVA vineyards, emphasizing the critical need for a grapevine testing program in New England to improve the health status of planting material.

4. Santos Silva, J. L., Alves Bento, E., de Moura, A. P., Costa Alves, T. R., da Silva, I. V. P., Gomes Souza, V. M., Avila Filha, V. M., Silva Ribeiro, J. W., **da Silva, W.**, and Ambrósio, M. (2025). Characterization and aggressiveness of Fusarium spp. associated with root and stem rot in Carica papaya in Northeast Brazil. *Plant Disease*. DOI: /10.1094/PDIS

-02-25-0400-RE

Abstract: In the past five years, papaya farmers in northeastern Brazil have been reporting major losses in fruit production, up to 50% in some years, due to diseases caused by soil-borne pathogens. To diagnose the causal agents of this disease's complex in the region (root and stem rots), we collected samples of root and stem from papaya plants in commercial fields exhibiting yellowing, wilting, and plant collapse. Fifteen Fusarium isolates were obtained from six production areas sampled, and Koch's postulates were carried out to confirm the pathogenicity of these isolates. Five species were identified causing this disease in the region: F. falciforme (FSSC 3+4), F. petroliphilum (FSSC 1), F. pernambucanum (FIESC 17), F. sulawesiense (FIESC 16), and F. delphinoides (FDSC). Among these species, the most aggressive was F. delphinoides, followed by F. pernambucanum, F. falciforme, and F. petroliphilum, and the least aggressive was F. sulawesiense. Our findings will aid the development of strategies to manage these disease complexes to help farmers reduce the damage caused by these pathogens in papaya in Brazil and other papaya production areas in the world.

5. de Moura, A. P., Santos Silva, J. L., Costa Alves, T. R., Silva Ribeiro, J. W., da Silva, I. V. P., da Costa Fernandes, J., Alves Bento, E., Gomes Souza, V. M., **da Silva, W.**, Queiroz Ambrosio, M. M. (2025). First report of Fusarium falciforme causing fruit rot in pumpkins (Cucurbita moschata var. sergipana) in the state of Rio Grande do Norte in Brazil. *Plant Disease*. DOI: 10.1094/PDIS-02-25-0376-PDN

Abstract: In early 2024, pumpkin growers in northeastern Brazil experienced significant losses (30% of fruits) due to a new disease causing dry, irregular, white, and rotten lesions on fruit peels. Researchers collected symptomatic pumpkins from three municipalities in Rio Grande do Norte state, Brazil, and isolated a fungus from the lesions. Through morphological characterization and genetic sequencing of the EF-1α and RPB2 genes, the isolated fungus was identified as Fusarium falciforme. Pathogenicity tests on healthy pumpkins confirmed that this fungus caused symptoms similar to those observed in the field, fulfilling Koch's postulates. While F. falciforme has been reported to cause rot in pumpkins in Taiwan and other cucurbits in Brazil, this study represents the first documented case of F. falciforme causing pumpkin rot in Rio Grande do Norte, Brazil. This discovery is crucial for developing effective disease management strategies in the region.

6. Moreira, G. V. S., Tavares, M. B., Cavalcante, A. L. A., de SS Alves, C. P., Sales, R., Negreiros, A. M. P., de Q Souza, M. T., **da Silva, W.** (2025). Reaction of two melon hybrids to Macrophomina phaseolina and M. pseudophaseolina. *Revista Caatinga*. DOI: 10.1590/1983-21252025v3812875rc

Abstract: Macrophomina phaseolina is a major phytopathogen linked to root rot and vine decline in melon plants in northeastern Brazil. Managing this pathogen is difficult due to its polyphagous nature and adaptation to the semi-arid conditions of the region. In this study, we inoculated 10 isolates each of M. phaseolina (Ph) and M. pseudophaseolina (Ps) onto two melon hybrids, 'Beloro' and 'Natal RZ', to assess their pathogenicity. Sixty days post-planting, we measured disease incidence (INC) and severity (SEV), shoot (SL) and root length (RL), fresh shoot and root weight (FSW and FRW), and dry shoot and root weight (DSW and DRW). The hybrid 'Beloro' exhibited a 100% INC across all tested isolates. The 'Natal RZ' hybrid showed INC ranging from 14.3 to 100.0%, with the Ph-A6P5 and Ps-A10P16 isolates causing no disease (INC and SEV of 0.0). Average SEV indicated that Ph isolates were more aggressive, causing severe damage to both 'Beloro' (4.58) and 'Natal RZ' (3.18), compared to Ps isolates, which showed lower severity scores in 'Beloro' (2.56) and 'Natal RZ' (0.70). Given the limited information on the pathogenicity of Ps in melon, further research is essential to determine the infectious potential of this fungus.

The Ph.D. candidate, Tatianne Alves, from the Universidade Federal Rural do Semi-Árido (UFERSA) in Brazil, who was co-advised by **Dr. da Silva**, successfully defended her thesis. Kudos to Tati!

Monique Rodrigues e Silva is awarded the Bayer Crop Science Graduate Student Travel Award for her research developed at CAES during the 64th Annual Meeting of the Society of Nematologists.

Monique Rodrigues e Silva presents her research conducted at CAES titled "Temperature Impacts on the Life Cycle of Two Root-Knot Nematode Species" at the 64th Annual Meeting of the Society of Nematologists

VALLEY LABORATORY

JATINDER S AULAKH, PH.D. attended the twilight meeting of the Connecticut Christmas tree growers' association and presented a research plot demonstration on summer weed suppression treatments at BK Tree Farm in Lebanon, CT (July 23, 2025); and visited a Christmas tree farm for weed control advisory in Brooklyn, CT (July 16, 2025).

CAROLE CHEAH, PH.D. met with a volunteer from the Cornwall Conservation Trust and released the HWA biocontrol agent Sasajiscymnus tsugae, at Ballyhack, Trinity and Cathedral Pines Preserves and a private forest on July 3; released S. tsugae donated by Tree Savers with a state forester at Salmon River State Forest in Colchester on July 21, at Devil's Hopyard State Park on July 22 and gave an overview of the Connecticut program of HWA biological control to forestry interns (3) at Great Mountain Forest in Norfolk then was shadowed by a GMF intern who participated in HWA scouting and release of S. tsugae donated by Tree Savers at the Black Spruce Bog Natural Area, Mohawk State Forest July 23

RICHARD COWLES, PH.D. presented "Aphids," on July 18 and "Preventing needle loss," on July 19 at the Christmas Tree Farmers Association's summer meeting, Fabius, NY (75 participants). He spoke to the Connecticut Christmas Tree Growers' Association about "Adelgid and spruce spider mite management, and how to interpret pesticide labels," Hebron, July 23 (45 participants).

JOURNAL ARTICLES APPROVED JULY 2025

Ali, I., **White, J. C.**, Ali, M. Transforming toxic element remediation: A necessary path for 21st century food security. *Trends in Plant Science*.

Cheah, C. The Farmington River: An example in collaborative biological control of invasive hemlock woolly adelgid. *RMS Journal*.

Keriö, S. E. Mulch and Tree Health. *CAES Fact Sheet.*

Li, D-W., Paine, E., Schultes, N. P. A Scytalidium-like indoor fungus revealing polyphyletic relationships and convergent evolution in Scytalidium. *Fungal Biology*

Li, H., Bai, Y.-Q., Xie, J.-Y., **Li, D.-W.** and Zhu, L.-H. Two new species of Pestalotiopsis causing needle blight of Pinus massoniana in China. *Journal of Fungi*.

Nattoh, G., Armstrong, P. M., and Brackney, D. E. Cellular and molecular keys to entry: mechanisms mediating Orthoflavivirus infection of the mosquito midgut. *PLoS Pathogens*.

Yan, X., **White, J. C.**, He, E., Gui, X., Peng, Y., Peijnenburg, W., Qiu, H. Rewiring micro-food webs: How copper nanopesticides can reshape nitrogen fluxes via trophic decoupling. *Science Advances*.

Zhou, J., Zuverza-Mena, N., Dimkpa, C. O., White, J. C. Copper-based materials mitigate salinity stress in hydroponically grown lettuce (Lactuca sativa L.). *Bioscience Nanotechnology*.

Zhou, L., Zhang, Q.-Y., Wan, Y., Chen, Y.-L., **Li, D-W.**, Tan, Y.-H., Sun, H., Zhu, L.-H. Three novel species of Cladosporium and Sarocladium isolated from Palm trees. *MycoKeys*.

Zhu, J., Zheng, Q., Zhou, W., Wang, X., Li, W., Li, J., **White, J. C.**, Zhan, X., Xing, B. Integrated evaluation of microplastic aging in soils and identification of driving factors. *Nature Sustainability*.

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