

# Station News

The Connecticut Agricultural Experiment Station

Volume 15 Issue 4 | April 2025



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*

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**JASON C. WHITE, PH.D.** met with Dr. Warren Schafer of Valent BioSciences to discuss nanotechnology and agriculture (March 3); met by Zoom with collaborators at Purdue University to discuss a summer research laboratory exchange at CAES (March 3); testified by Teams in front of the CT State General Assembly's Appropriation Conservation & Development Work Session (March 3); spoke by Teams with staff at CT DEEP to discuss draft legislation on noenicitinoid insecticides (March 5, 13); along with **Nubia Zuverza-Mena, Ph.D., Jingyi Zhao, Ph.D.,** and **Sara Nason, Ph.D.** participated in a Zoom meeting with collaborators at Yale University and the University of Minnesota for a joint NIEHS grant (March 4); met by Teams with staff at CT DPH, CT DoAg and CT DCP to discuss PFAS testing in various foods (March 4); met by Teams with staff at CT Innovation to discuss nanotechnology and agriculture (March 5); participated in the weekly NSF Center for Sustainable Nanotechnology (CSN) all hands call by Zoom (March 5); met by Zoom with colleagues at the University of Minnesota and Convergent Biosciences to discuss collaborative research (March 5); met by Teams with staff at the CT DCP Drug Control Division to discuss the cannabis testing program (March 5); along with CAES Vice Director **LINDSAY TRIPLETT, PH.D.** and **Kelsey Fisher, Ph.D.** participated in filming of the CAES 150<sup>th</sup> Anniversary video (March 7); spoke by Zoom with colleagues at Auburn University to discuss collaborative research (March 7); provided welcoming remarks to the 2025 CAES Forest Health Symposium in Jones Auditorium (March 11); met with Prof. Saion Sinha of the University of New Haven to discuss collaborative research (March 11); provided welcoming remarks to the 2025 Annual Tobacco Growers meeting (March 12); spoke by Teams with a candidate for the CT Tree Protection Examining Board (March 12); along with **Yi Wang, Ph.D.** spoke by Zoom with colleagues at Louisiana State University to discuss collaborative research and a laboratory exchange (March 12); gave a tour of CAES and a description of programs to students and a teacher from the Northwestern Regional Agriculture Center (March 13); attended the NanoFlorida International Conference 2025 at Florida International University in Miami, Florida and gave a platform presentation entitled "Nanobiotechnology-based Strategies for Enhanced Phosphorus and Nitrogen Delivery to Crop Species" (March 14-16); was elected as an Honorary Fellow to the Global Academy of Nanotechnology (March 16); along with **Blaire Steven, Ph.D.** and **Jing Yu-an, Ph.D.** participated in a bimonthly USDA project meeting with collaborators at the University of Delaware and the National Research Council of Italy (March 18); along with **Sudhir Sharma, Ph.D.** participated in a Zoom call with colleagues at Columbia University to discuss collaborative research (March 15); along with **Katherine Dugas, Nate Westrick, Ph.D.** and **Jeremiah Foley, Ph.D.** participated in the 2025 Ag Day at the Capital (March 19); along with **Chaoyi Deng, Ph.D.** hosted 4 staff members from CT Innovations to discuss nanotechnology and agriculture (March 20); hosted the quarterly CAES Safety Committee meeting (March 21); spoke by Teams with a colleague at Utah State University to discuss USDA NIFA funding (March 21); spoke by Teams with a colleague at Merrimack University to discuss collaborative research (March 21); spoke with colleagues at Environment & Human Health, Inc. to discuss current and future initiatives (March 21); spoke by phone with staff at Senator Chris Murphy's office on the topic of Congressionally Directed Spending projects (March 24); spoke with colleagues at North Carolina State University about nanotechnology and agriculture (March 24); attended the American Chemical Society Spring 2025 conference and gave a platform presentation entitled "How the NSF Center for Sustainable Nanotechnology (CSN) became a leader in the chemistry of nanoparticle-plant interactions" (March 25-28); attended by Zoom the Amity Institute of Food Technology International Conference on "The Future of Food Science & Technology: Innovations, Sustainability, and Health" in Uttar Pradesh India and gave a presentation entitled "Nano-enabled agriculture: A path to global food security in a changing climate" (March 28); spoke by Teams with staff at the CT Attorney General's office regarding PFAS testing (March 29); and served as a tour guide for a group of 6-8<sup>th</sup> graders

from St James School in Stratford (March 31).

## **PUBLICATIONS:**

1. Zhang, J.; **White, J. C.**; Lowry, G.V.; He, J.; Yu, X.; Yan, C.; Dong, L.; Tao, S.; Wang, X. (2025). Advanced enzyme-assembled hydrogels for the remediation of contaminated water. *Nature Comm.* 16:3050.

**Abstract:** Enzyme-catalyzed biodegradation is an emerging green strategy for environmental remediation, although challenged by high cost and poor robustness. Herein, natural biopolymer (cellulose)-derived hydrogels concurrently doped with  $\beta$ -cyclodextrin and montmorillonite nanosheets that are synthesized in one-step demonstrate exceptional pollutant affinity and mechanical strength. Laccase is then stably and effectively assembled onto the hydrogels by a facile strategy based on charge-assisted H-bonding, which can be extended to other enzymes. The advanced laccase-assembled hydrogels display excellent stability and increased degradation activity achieved by strong substrate capture and rapid electron transfer. The laccase-assembled hydrogels exhibit significantly improved removal (62-fold) and degradation (52-fold) performance compared to free laccase for diverse organic pollutants (e.g., polycyclic aromatic hydrocarbons) in real wastewater. This enhanced performance is maintained despite the presence of heavy metals, other organic chemicals or dissolved organic matter. This work provides a practical strategy for designing an advanced and sustainable biodegradation tool for environmental remediation.

2. O’Keefe, T. L.; Tuga, B.; Deng, C.; Mahmoud, S.; Jamous, R.; Sanders, M.; **White, J.C.**; Haynes, C. L. (2025). Vacuum filtration for priming of soybean seeds: Optimization and particle tracking using fluorescent silica nanoparticles. *Chem. Sci.* DOI: [10.1039/D4SC08566C](https://doi.org/10.1039/D4SC08566C).

**Abstract:** Agrochemical delivery is highly inefficient, and novel application methods are necessary to promote crop health and yields while reducing environmental impact. In this work, a vacuum infiltration seed priming strategy was developed to incorporate silica nanoparticles into soybeans. Although successful in initial greenhouse and field studies, little is known about the amount of nutrient being delivered and the conditions for optimum accumulation. Herein, various infiltration conditions were evaluated using fluorescent silica nanoparticles and confocal microscopy, including nanoparticle surface charge and concentration, infiltration time, infiltrate ionic strength and pH, and seed presoaking. Negative nanoparticle surface charge, higher nanoparticle concentration, shorter infiltration time, and potassium-based salts resulted in greater nanoparticle infiltration. Seed coat elemental analysis complemented fluorescence data and highlight the co-delivery of beneficial macronutrients like potassium and magnesium under ionic salt infiltration conditions. Overall, these findings illustrate a new strategy to biofortify nanoscale nutrients into soybean seeds that can be expanded into other agrochemical targets and crop species to promote sustainable agriculture.



**JASON C. WHITE, PH.D.** and Professor Swadesh Santra at the 2025 NanoFlorida Conference at Florida International University in Miami Florida.



**JASON C. WHITE, PH.D., Hina Ashraf, Ph.D.** and **Chaoyi Deng, Ph.D.** at the Spring American Chemical Society meeting (top). The NSF Center for Sustainable Nanotechnology at its final "All Hands" meeting after 13 years of funding.



**Mandeep Kaur, Ph.D.** attended “The 9th Biennial Yale Food Systems Symposium on “Healing Harvest: Transforming Food Systems for Tomorrow” on March 28, 2025.

**Raja Muthuramalingam, Ph.D.** presented his latest research at the 9th Biennial Yale Food Systems Symposium, held on March 28, 2025. His poster, titled “Sprayable NanoBioEmulsion Film for Post-Harvest Protection Against Fusarium-Induced Rot and Mycotoxin Contamination,” showcased innovative findings on nanotechnology-based strategies to improve food safety and reduce post-harvest losses.



### PUBLICATIONS:

1. Irewale, A.T., Elemike, E.E., Allabakshi, S.M., **Dimkpa, C.O.**, Oguzie, E.E. (2025). Theoretical and experimental insights into BET surface area and pore analysis of Water Hyacinth biochar: prospects for efficient bio-nanofertilizer development. *MRS Advances*. [DOI: 10.1557/s43580-025-01248-1](https://doi.org/10.1557/s43580-025-01248-1)

**Abstract:** Biochar (BC), a carbon-rich material produced through pyrolysis, has garnered attention for its versatility in feedstock utilization and applications in agriculture, medicine, green energy, environmental remediation, and carbon management. This study investigated the adsorption properties of BC from water hyacinth (WH) stem and leaf biomass pyrolyzed at 600 °C with residence times of 15, 30, 45 and 60 min. Using Brunauer–Emmett–Teller (BET) analysis, specific surface area and pore volume of samples were measured, revealing ranges of 236.44–249.41 m<sup>2</sup>/g and 0.061–0.087 cm<sup>3</sup>/g, respectively. BET analysis with positive slopes and intercepts indicate a monolayer adsorption model. However, adsorbed gas volumes versus relative pressures suggest feasible capillary condensation at higher relative pressure, indicating BC with mesoporous or microporous structures. This study aims to guide the production of BC with tailored adsorption properties for nanonutrient fortification, facilitating the development of efficient biogenic fertilizers from abundantly available WH for sustainable agricultural applications.

### NEW DEPARTMENTAL STAFF:

**Mickaël Wagner** is a PhD student at the University of Toulouse, France. He is working on plant-nanoparticle interactions at the leaf interface under the supervision of Astrid Avellan and Camille Larue. He is interested in identifying how physicochemical properties related to NP reactivity influence their ability to adhere, be taken up, on/in plant leaves, and translocate into plant organisms. He joined the Connecticut Agricultural Experiment Station (CAES) on



March 14, 2025, for 3 months to conduct an experiment aimed at identifying copper (Cu) allocation and transfer mechanisms from leaves to roots. This experiment aims to determine the role of solubility of leaf-exposed NPs influencing their transfer and root exudation, and the strategy of storage and management of the deposited material from the exposed leaf to the rhizosphere. His work aims to understand the fate of NPs at the atmosphere-plant-soil interface, which will be essential in the search for nanoparticulate forms of safe phytosanitary products that can reduce resource use and contamination of agroecosystems. On a larger scale, understanding these interactions will also allow better prediction of the fate of atmospheric pollutants when deposited on plant leaves.



**ANGELA BRANSFIELD** presented the results of the *Mosquito-Borne Disease Risk Communication Survey* to Connecticut Mosquito Program partners (14 attendees) (Mar 4); participated via Zoom in Yale University's Biosafety Committee meeting (Mar 20); participated in a CAES Health and Safety Committee meeting (Mar 21).

**JAMIE L. CANTONI** served as a tour guide for 86 students and 5 staff members participating on a middle school science trip from St. James School, Stratford, CT (Mar 31).

**KATHERINE DUGAS** tabled about the CAES's public services in CT at the CT NOFA conference (Mar 1); participated in an insect pest Q&A session with the Garden Club of New Haven (Mar 3, 12 adults); gave a talk about invasive insects and the IIO at the Ferguson Library in Stamford (Mar 12, 20 adults); tabled about CAES's public services at the Ag Day at the Capitol (Mar 19); was interviewed by Chris Valenski at CT Public radio about spongy moth and climate change (Mar 25) and served as a tour guide for 86 students and 5 staff on a school science trip from St. James School, Stratford, CT (Mar 31).

**HANY K. M. DWECK, PH.D.** participated in the 2025 Connecticut Farm Winery Education Symposium and gave a presentation on the Chemical Ecology and Behavior of Spotted Wing *Drosophila*, a Pest of Grapes and Small Fruits (March 27, 25-30 attendees).

**KELSEY E. FISHER, PH.D.** tabled about the potential impact of European corn borer Bt resistance in CT at the CT NOFA conference (Mar 1); met with Dr. Sarah Lawson at Quinnipiac University about collaborations and grant opportunities (Mar 5, 19, 26); met with the Environment Committee about risks and benefits of neonicotinoid use in CT (Mar 7); attended Charlotte Brennan's MS thesis proposal meeting for her work on frosted elfin conservation and dispersal ecology (Mar 10); attended and discussed relevant research contributions at the Canaan Valley Agricultural Cooperative annual meeting (Mar 12); attended the Entomological Society of America Eastern Branch conference in Harrisburg, PA (Mar 15-18) and presented three oral presentations: "My unicorn job: What it is like to work in a state government research position", "Do small, manicured pollinator gardens support bumblebee (*Bombus* sp.) success?", and "Nature finds a way: Evidence of European corn borer practical resistance to Bt corn in CT"; Karena Kulakowski, an undergrad student in the Fisher Lab, presented a 10-minute presentation titled "Mowing for monarchs: Can strategic mowing practices improve monarch butterfly habitat in CT" and placed second in the undergraduate student competition; met with the CAES DEI climate survey working group (Mar 19); met and brainstormed with Erik Dopman (Tufts University) and Brad Coates (USDA-ARS-CICGRU) about collaborative opportunities (Mar 19, 24, 31); participated in site responsible researcher training for a collaborative research project with Bayer Crop Science (Mar 20) and met with Bayer collaborators on research design and needs for 2025 (Mar 21); met with members of the NC246: Ecology and Management of Arthropods in Corn about a collaborative genomics work to identify the mechanisms of resistance in Connecticut and Canada (Mar 21); presented "Monarch butterfly biology, ecology, and conservation needs" to the Trillium Garden Club (Mar 24; 20 attendees); met with Quan Zeng about collaborative opportunities with bumblebee research (Mar 28); organized and facilitated the Connecticut Entomological Society student presentation meeting (Mar 28); met with UConn and Virginia Tech extension about a potential community informed science project to understand *Bombus* sp. Utilization of urban gardens (Mar 31); met with Shawn Wallace and Laurelbrook Farm about corn research collaborations in 2025 (Mar 31).

**MEGAN LINSKE, PH.D.** participated in a meeting with collaborators from BanfieldBio, Inc. and North Carolina State University to discuss blacklegged tick repellency trials and botanical acaricide development and application (Mar 4, 11, & 18); participate in a meeting the

Mrs. Julie Lister from the Women and Family Life Center (WFLC) to discuss development of a girl's STEM program (Mar 7); hosted the Wildlife Society (TWS) Leadership Institute Committee meeting as an alumnus and Committee Chair (Mar 13); was interviewed by news outlets including [CT Insider](#), [Hartford Courant](#), [The Day \(via PressReader\)](#), [WTNH News 8](#), [WFSB](#), and [WSHU](#) following the release of the Active Tick Surveillance Program press release, which highlighted recent updates in Connecticut's tick and pathogen density, diversity, and distribution (Mar 24-27); gave an invited presentation for the New England Center of Excellence in Vector-Borne Diseases and University of Massachusetts Amherst meeting titled "Innovative Tick Control: Acaricide Strategies for Managing Blacklegged Ticks While Protecting Pollinators" (approx. 30 attendees; Mar 26); gave a presentation for the Guilford Fund For Education for funding for the WFLC STEM program development (Mar 26); participated in a call with staff from the Centers for Disease Control and Prevention's Division of Vector-Borne Diseases on progress made on a funded integrated tick management and seasonal spray projects (Mar 26).

**JACOB RICKER** gave a talk about invasive insects to the Montville American Job Center, Uncasville, CT (10 attendees, Mar 19). Was interviewed by Chris Polansky from CT Public Radio regarding the history of spongy moth in CT (Mar 25).

**GALE E. RIDGE, PH.D.** presented two talks at the New Jersey Environmental Health Association annual educational conference in Atlantic City. The first talk was on bed bugs and their management and the second on Delusional Infestation (March 3-4) (~200 attendees); Connecticut NPR, Audacious with Chion Wolf Show broad cast an interview with Dr. Ridge on Delusional Infestation. It was also made into a podcast titled, "How Delusional Infestation makes you feel bugs that aren't there" (March 8); presented a talk on bed bugs and their management to the staff of Sound Community Services, New London (15 attendees) (March 12); presented a webinar on Delusional Infestation via the Great Plains Diagnostic Network which was linked to the National Plant Diagnostic Network with attendees in the United States, Canada, and Europe (March 19); interviewed about early spring activity of pest insects and ticks by Harlan Levy, We-Ha.com journal; and was visited in the insect information office by 86 students and 5 staff on a school science trip from St. James School, Stratford, CT.

**CLAIRE E. RUTLEDGE, PH.D.** participated as an examiner for the oral portion of the Connecticut Tree Protective licensing exam (March 5) (3 examinees), taught the 'Tree Conditions Laboratory' for the Connecticut Tree Protective Association Arboriculture 101 (March 6) (45 students), New Haven, CT. Gave the talk 'Spotted Lanternfly, where is it, where is it going and how can we predict it' to the Forest Health Workshop, New Haven CT (March 11) (75 attendees). Gave the presentation on-line 'Hope for Connecticut's Ash: Biological control of emerald ash borer' for the Advanced Master Gardeners (March 12) (80 attendees). Talked about the history of emerald ash borer in Connecticut with visiting students from Northwestern Regional Agriculture Center, New Haven, CT. (March 13) (10 students). Gave a talk 'Wild bees in Connecticut' to Cheshire Pollinator Pathway, Cheshire (March 13) (40 attendees). Talked with Jessie Wright of the Redding Sentinel about overwintering ladybeetles (March 13). Attended planning session on-line with Kevin Dodds, US FS, and representatives from Connecticut, Rhode Island and Massachusetts to organize a meeting on Southern Pine Beetle in southern New England (March 17), gave a talk 'Hope for Connecticut's Ash Trees' at the annual meeting of the Society of American Foresters, Yankee Division, Devins MA (March 27) (80 attendees).

**JOHN SHEPARD** presented the invited talk "Jamestown Canyon Virus: Key Species in the Northeast" at 112th Annual Meeting of the New Jersey Mosquito Control Association in Atlantic City, NJ (March 19-21) (150 attendees); spoke about mosquitoes and the state Mosquito Trapping and Testing Program to middle school students from St. James School, Stratford, CT (Mar 31) (86 students, 5 staff).



**PAULA WOLF** taught a 6-session Introduction to Beekeeping course for Nonnewaug Adult Education (Weekly, March 5-April 9); participated in the Apiary Inspectors of America virtual meeting (March 19); participated in the Eastern Connecticut Beekeepers Annual Meeting (March 23, 47 attendees); gave a talk about the state apiary program to new beekeepers at Massaro Farms (March 29, 13 attendees).

**TRACY A. ZARRILLO** met with Ms. Kathleen Connolly to discuss a collaboration about stem nesting bees (March 26); was on a panel of pollinator experts and was interviewed about Connecticut bees at a HuneeBee event in Hamden (March 27, 40 attendees); met with UConn and Virginia Tech extension about a potential community informed science project to understand *Bombus* sp. utilization of urban gardens (Mar 31).

### PUBLICATIONS:

1. Ware J., Awad, J., Brar, G., Cadwalader, E., Dillard, D., Esposito, L., Evans, E., **Fisher, K. E.**, Grozinger, C., Kawahara, A., Krupke, C., Lucky, A., Mankin, R., Moreau, C., Owens, A., Sandall, E., Seltmann, K., & Winton, R.. (2025). Defining the Decline: A glossary relevant to insect decline. *Journal of Insect Science*. DOI: [10.1093/jisesa/ieaf048](https://doi.org/10.1093/jisesa/ieaf048)

**Abstract:** Insects are declining in abundance and species richness, globally. This has broad implications for the ecology of our planet, many of which we are only beginning to understand. Comprehensive, large-scale efforts are urgently needed to quantify and mitigate insect biodiversity loss. Because there is broad interest in this topic from a range of scientists, policy-makers, and the general public, we posit that such endeavors will be most effective with precise and standardized terms. The Entomological Society of America is the world's largest association of professional entomologists and is ideally positioned to lead the way on this front. We provide here a glossary of definitions for biodiversity loss terminology. This can be used to enhance and clarify communication among entomologists and others with an interest in addressing the multiple overlapping research, policy and outreach challenges surrounding this urgent issue.

2. **LaReau J. and Gloria-Soria A.** *Aedes aegypti* (yellow fever mosquito). Vector of the Month. *Trends in Parasitology*. DOI: <https://authors.elsevier.com/a/1ksqE5Eb1xN6KC10.1016/j.pt.2025.03.007>

**Abstract:** *Aedes aegypti* is widely considered the main vector of dengue (DENV), chikungunya (CHIKV), Zika (ZIKV), and yellow fever (YFV) viruses. *Ae. aegypti* originated in the southwest Indian Ocean, entered Africa <85 000 years ago, and spread to the global tropics and subtropics in the past half century. Its expansion to temperate latitudes continues today aided by human-mediated transport of adults, larvae, or eggs, as well as climate change. Two morphologically differentiated forms exist: in Africa, the dark form *formosus* breeds in forests and feeds predominantly on non-human animals; outside Africa, the light form *aegypti* feeds on humans and breeds mostly in artificial containers. This day-biting mosquito has multiple generations per season, laying eggs singly above the water line, distributing a clutch across several sites over hours or days. Flooding triggers hatching, with larvae developing in clean water or water with low-organic content. Eggs are resistant to desiccation and remain viable for several months.

## NEW DEPARTMENTAL STAFF:

**Dr. Caleb Bryan** joined the **Fisher Lab** on April 1, 2025, as a postdoc. He joins us from Dr. Dean Prager's lab at the University of Saskatchewan. Caleb will be contributing to work related to bumblebee conservation and dispersal ecology.



The CAES Tempestry Collection has been installed in the windows of the Insect Information Office in the Jenkins-Wagner building. This project represents the history of weather data collection at CAES and the changes in the climate over the life of the station. Each Tempestry represents New Haven for a particular year, and each knit row is a day with the color corresponding to the temperature, moving from blues for cold up through greens, yellows and finally reds. The collection includes Tempestries starting in 1875 and then one for each 25th year thereafter. 2025 is a work in progress. This is part of the Connecticut Agricultural Experiment Station's 150 anniversary celebration and is created with data from CAES. Knit by Claire Rutledge, Christine Armer, Kiersten Jennings Chou, Michael Kashgarian and Leah Worton it is part of the larger Tempestry project at [Tempestry.com](https://tempestry.com).

**SCOTT C. WILLIAMS, PH.D.** gave invited lecture titled “Experimental Fall Application of a Synthetic Pyrethroid to Manage Ticks While Minimizing Exposure to Non-Target Insects” at the Cornell Cooperative Extension’s Long Island Horticulture Conference at Brookhaven National Laboratory (100 attendees) (March 4); met with staff from Yale University’s Peabody Museum about collaborative tick management research (March 5); hosted a collaborative research meeting with staff from White Buffalo, Inc., Genesis Laboratories, Inc, and Maine Health (March 6); participated in a meeting with BanfieldBio on a collaborative CDC grant investigating the effectiveness of botanical formulations in managing ticks in peridomestic habitats (March 11); participated in a meeting with BanfieldBio on a collaborative NIH SBIR grant investigating tick repellent formulations to be integrated into fabrics (March 18); spoke to Northwest Connecticut reporter Alec Linden about ticks and seasonal tick emergence (March 21); participated in a meeting of the Northeast Section of The Wildlife Society (March 24); participated in a meeting with staff from the CDC Division of Vector-Borne Diseases on progress made on a funded integrated tick management project (March 26).

**NATALIE BAILEY** attended the Long Island Horticulture Conference in Upton, NY (March 4); participated in a Zoom call with BanfieldBio to discuss the development of a botanical acaricide (March 11, 25); participated in a collaborative Zoom call with members of Banfield Biologic NIH SBIR-funded tick repellent fabric team (March 18).

**JOSEPH P. BARSKY** participated in a meeting of local coordinators for the National Society of American Foresters 2025 Annual Conference (March 3); participated in the New England Society of American Foresters (NESAF) Winter Meeting Planning Committee meetings (March 3, 10); participated in the 2025 Forest Health Symposium in Jones Auditorium (March 11); organized and presided as Chair during the 2025 NESAF Annual Business Meeting in Devens, MA (March 26).

**JESSICA E. BROWN, PH.D.** participated in a Zoom call with BanfieldBio to discuss the development of a botanical acaricide (March 11, 25); participated in a collaborative Zoom call with members of Banfield Biologic NIH SBIR-funded tick repellent fabric team (March 18); presented a virtual guest lecture on the biology and social impacts of agricultural diseases to an undergraduate course at The Pennsylvania State University (60 attendees) (March 18).

**GREGORY J. BUGBEE** provided opening remarks and spoke on “Invasive Aquatic Plants in CT – An Update” at a CAES OAIS-sponsored aquatic plant workshop in the Jones Auditorium (50 attendees) (March 1); gave invited lecture titled “Invasive Aquatic Plants” to a science class at the Beardsley Zoo in Bridgeport (12 attendees) (March 4); as part of a Virtual UCONN Master Gardener Class, gave invited lecture titled “Container Gardening Indoors and Out” (35 attendees) (March 5); gave invited lecture titled “Improving Soil in the Home Garden” to the Clinton Arbor Garden Club at the Henry Carter Hull Library in Clinton (40 attendees) (March 13); gave invited lecture titled “Invasive Aquatic and Terrestrial Plants” to CT DEEP trainees at Montville American Jobs Training Center (10 attendees) (March 18); spoke at a meeting of the Lower Connecticut River Council Governments on CAES sponsorship of United States Army Corps of Engineers cost share funds for CT aquatic plant management at their office in Essex (25 attendees) (March 26); spoke on “Pachaug Pond Survey Results- 2024” to the Pachaug Pond Weed Control Association at the Griswold Town Hall (30 attendees) (March 26); presented four talks on “Soil Testing” as part of a middle school tour of CAES (65 attendees) (March 31); via teleconference provide input at United States Army Corps of Engineers CT River hydrilla demonstration project and Massachusetts hydrilla ex-



pansion workgroup meetings (March 3, 7, 12, 19, 20, 27).

**RILEY S. DOHERTY** presented on the CT AIS Web App and US Army Corps of Engineers Aquatic Plant Control Cost Share Program to members of the public as part of the Office of Aquatic Invasive Species Workshop in Jones Auditorium (40 attendees) (March 1); attended the ESRI Developer and Technology Summit in Palm Springs, CA (March 10-14); presented an invasive aquatic plant workshop at the Montville Job Center for prospective CT DEEP State Park seasonal employees with **Gregory Bugbee** (12 attendees) (March 19); participated in the Connecticut Federation of Lakes board of directors meeting (March 19); coordinated and participated in the Diversity, Equity, and Inclusion Committee professional development and education subcommittee meeting (March 21); participated in a Connecticut Federation of Lakes legislative subcommittee meeting to discuss the need for an invasive aquatic plant rapid response program (March 25); attended the Project Delivery Team meeting with the US Army Corps of Engineers to discuss the CT River Hydrilla Demo Project (March 26); participated in the Pachaug Pond aquatic vegetation survey results meeting in Preston, CT with **Gregory Bugbee** (20 attendees) (March 26).

**JEREMIAH R. FOLEY, IV, PH.D.** participated in a Town Hall-style event hosted by the Yale School of the Environment on invasive species in Union, CT (50 attendees) (March 12); attended Ag Day at the Capitol as an exhibitor representing CAES (March 19); guest lectured in Dr. Duguid's course, Invasive Species: Ecology & Management, at the Yale School of the Environment (14 attendees) (March 27).

**SUSANNA KERIÖ, D.SC.** administered the arborist examinations (March 5); attended the Minnesota Shade Tree Short Course in Bethel MN and presented two invited lectures on "Site Factors, Soil Properties, and Tree Health" (130 attendees) (March 11) and again on March 12 (100 attendees); met with Chris Ozyck from Yale Urban Resource Initiative to visit oak progeny trial sites of the Urban Silvicultural Network to plan phenotyping field work (March 14); co-organized and attended the Branching Out Conference in New London, moderated sessions, and attended the Connecticut Urban Forest Council's meeting as an executive board member (March 19-20).

**SARA L. NASON, PH.D.** as the chair, led virtual meetings for the Best Practices for Non-Targeted Analysis working group (March 3, 4, 18); 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 (March 4); met virtually with Thivanka Ariyaratna (Rowan University) to discuss collaborative research on PFAS in marine food webs (March 6); 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 EPA funded collaborative work on PFAS (March 10); hosted a visit from Thivanka Ariyaratna (Rowan University) where we developed plans and methods for collaborative research on PFAS in marine food webs (March 17-19); met virtually with representatives from Thermo Scientific to discuss future instrumentation needs at CAES (March 26).

**ELISABETH B. WARD, PH.D.** participated on the review panel for the U.S. Forest Service Infrastructure Investment and Jobs Act Invasive Species proposals (March 5); hosted the annual Connecticut Forest Health Symposium at CAES and presented a talk titled "CT Forest Health Program Highlights: 2024 Year in Review" (March 11) (80 participants); participated in the monthly Forest Ecosystem Monitoring Cooperative State Coordinators meeting (March 13); virtually participated in the Northeast-Midwest State Foresters Alliance Forest Health Committee meeting in Minneapolis, MN and gave a presentation on Connecticut Forest Health

updates (March 18-20) (35 participants).

**SUMMER WEIDMAN** gave an aquatic plant identification and remote sensing technique lecture as part of the Office of Aquatic Invasive Species Workshop in Jones Auditorium (40 attendees) (March 1); participated virtually in the CT River Hydrilla Field Team Planning Meeting with the US Army Corps of Engineers (March 3); chaired a virtual meeting of the Guilford Conservation Commission Lake Quonnipaug Subcommittee (March 4); participated in virtual meetings with the US Army Corps of Engineers to discuss CT River Hydrilla (March 12, 26); led a working meeting of the DEI Climate Survey subcommittee (March 19); participated virtually in the CT State Interagency GIS Meeting (March 19); participated in the DEI Professional Development and Education subcommittee meeting (March 21); met virtually with Lake Housatonic stakeholders to discuss treatment methods (March 21); met virtually to discuss the Next Gen Scientists program (March 24); gave an Invasive Plant Workshop to the Wood-Pawcatuck Watershed Association in North Stonington (15 attendees) (March 25); led a tour of CAES for middle schoolers from St. James Middle School (March 31).

**LEIGH J. WHITTINGHILL, PH.D.** gave a talk at a workshop with Jacqueline Kowalski, UConn Cooperative Extension, Extension Educator in Urban Agriculture, titled “Discussions about management practices for repeat harvested greens” at the CT NOFA winter conference (24 attendees) (March 1); assisted with an Agricultural Science and Technology Education Compliance Review (March 5, 6); presented a talk “Small Plastic Pool Container Production of Cucumbers” at the Middletown Garden Club (26 attendees) (March 20); attended the quarterly meeting of the CT Council on Soil and Water Conservation (March 27); ran a meeting of the Disability and Accessibility subcommittee of the DEI committee (March 27); attended the Yale Food System Symposium (March 28).

**YINGXUE (CHARLIE) YU, PH.D.** discussed with scientists from the Environmental Molecular Sciences Laboratory (EMSL) about the quantification of nanoplastics using Py-GC/MS (March 24); served on the Ph.D. Preliminary Exam committee for Xueyu Zhou at Washington State University (March 25); gave an oral presentation titled “Environmental Impacts of Biodegradable Plastic Mulch” in the Department of Crop and Soil Sciences at Washington State University (30 attendees) (March 31).

### PUBLICATIONS:

1. **Ward, J. S., Ward, E. B., Barsky, J. P.** (2025). Excluding deer browse increases stump sprouting success and height growth following regeneration harvests. *Canadian Journal of Forest Research*. DOI: [10.1139/cjfr-2024-0318](https://doi.org/10.1139/cjfr-2024-0318).

**Abstract:** Slash walls are a novel strategy that could help maintain species on sites where ungulate browse limits tree regeneration. We established five slash walls in southern New England, USA to examine the influence of pre-harvest tree metrics and deer exclusion on stump sprout height and survival at 160 sample points (n=1,509 trees). For all species groups, dominant sprouts were taller inside the walls at the end of the first and second growing seasons. After two years, mean sprout heights were ~2.5-times higher for *Quercus rubra* (1.8 vs. 0.7 m) and >6-times higher for *Acer saccharum* (2.0 vs. 0.3 m) inside the walls. For some species, the proportion of stumps with a live sprout after one year was higher inside the slash walls (56% vs. 28% for *Q. rubra* and 77% vs. 55% for *Carya ovata*). By contrast, sprouting success was uniformly high for *Acer rubrum* (78%) and *Liriodendron tulipifera* (87%). Differences in sprout survival inside versus outside the walls increased during the second year for *Q. rubra*, *C. ovata*, and *A. saccharum*. Where maintaining *Q. rubra* is a management objective, excluding deer will increase both the growth of stump sprouts and the proportion of stumps with a live sprout.



## DEPARTMENTAL NEWS:

**Elisabeth Ward, Ph.D.** and husband Skylar Albertson are the proud parents of Sasha Joyce Ward Albertson, born on the first day of spring, March 20, 2025. Mom, Dad, and Baby Sasha are home and doing well.





## PLANT PATHOLOGY AND ECOLOGY

**LINDSAY TRIPLETT, PH.D.** hosted and met with invited speaker Dr. Leslie Shor of UCONN (March 5) and Dr. Alex Canto-Pastor of Yale (March 19), was interviewed for a video celebrating CAES's 150<sup>th</sup> anniversary (March 7), and represented CAES at the AgInnovation Northeast Spring Meeting (Ellicott City, MD March 24-26).

**YONGHAO LI, PH.D.** instructed "Tree Diseases" for the Tree Condition Lab of Arboriculture 101 Courses in New Haven. (March 6, 28 adults); presented "Principles of Organic Gardening" for the Oxford Public Library Education Program (March 13, 26 adults); participated in "ELISA Fundamentals Workshop" hosted by the USDA Plant Pathogen Confirmatory Diagnostics Laboratory (PPCDL) in Laurel, MD (March 25-26).

**ROBERT MARRA, PH.D.** administered the arborist certification oral exam ("TPX") (March 5); participated in the CT TPX Board business meeting (March 5); gave a presentation on the ecology of fungi in the forest to the Stamford Garden Club at Bartlett Arboretum (March 11) (45 adults); gave a presentation titled "Beech Leaf Disease: Observations from Japan and Research Updates (March 11)(75 adults); gave a presentation on four diseases impacting northeastern forests at the Wild Ones Native Plant Society winter meeting (March 15)(50 adults); participated in the monthly meeting of the APS Divisional Forum Representatives (March 25).

**FELICIA MILLETT** participated in the "Phytophthora 101" Workshop hosted by the USDA Plant Pathogen Confirmatory Diagnostics Laboratory (PPCDL) in Laurel, MD (March 3 – 7); participated in the NPDN Professional Development Committee monthly meeting (9 adults) (March 10); presented "Introduction to Invasive Plants" to the Manchester Garden Club (45 adults) (March 10); prepared a poster on Bacterial Leaf Scorch Symptoms for the CT Forest Health Symposium (March 11); presented "Native Plants in the Garden" to the Down to Earth Garden Club South Windsor (32 adults) (March 12); delivered the NPDN Proficiency Committee's 2024 Accomplishments Report and 2025 Plan of Work at the NPDN Annual Committees Work Update Meeting (34 adults) (March 12); spoke to students from Northwest Regional Ag Center about PDIO and the Seed testing Lab (8 students) (March 13); participated in the NEPDN monthly meeting (15 adults) (March 13); hosted the NPDN Proficiency Committee monthly meeting (4 adults) (March 18); presented "Growing Annuals from Seed" to the Hamden Public Library (26 adults) (March 18); presented "Native Plants in the Garden" to the Preston Public Library Parks and Recreation (11 adults) (March 27); and hosted middle school student from St James School Stratford in the Plant Disease Information Office (90 students) (March 31).

**QUAN ZENG, PH.D.** held a zoom meeting with 9 organic apple growers in the northeast and discussed the USDA-funded "2+2" fire blight organic management trials with Dr. Jared Jensen of San Agrow Inc and Vijay Chopokatla of BiosSafe Inc (March 10), gave two extension talks at the New Hampshire Apple Grower Association entitled "2+2 organic fire blight management" and "How does *Erwinia amylovora* enter leaves and cause shoot blight" (March 12) (100 adults), met Dr. Alex Canto-Pastor from Yale and discussed research collaborations (March 19), presented a guest lecture " How do bacteria talk to each other in rhizosphere and what does it mean to plant health? " at Pennsylvania State University through zoom (20 adults).

### DEPARTMENTAL NEWS:

Triplett Lab member Cole Wilson, a senior at Quinnipiac University, has been accepted to the Agricultural Biology graduate program at Colorado State University, where he will study wheat immunity to bacterial disease in the lab of Robyn Roberts. Congratulations, Cole!



PPE Technician **Regan Huntley** hosts a memory game for CAES Staff at a baby shower for **Dr. Raquel Rocha**, March 28.

## VALLEY LABORATORY

**CAROLE CHEAH, PH.D.** gave a presentation on biological control of hemlock woolly adelgid in Connecticut for the Annual Meeting of the Yankee Division of the Society of American Foresters, at Sturbridge, MA on February 7, 2025 (50); gave a presentation on expanding biological control of hemlock woolly adelgid in Connecticut at the CAES Forest Health Symposium held at the CAES New Haven on March 11, 2025 (80); led a tour for the Roxbury Land Trust Land & Property Manager and President to assess hemlocks for hemlock woolly adelgid at the Mine Hill Preserve, Roxbury Land Trust on March 20, 2025 (2).

**RICHARD COWLES, PH.D.** presented “Climate change impacts on plant and pest growth,” to SavATree, Southbury, March 4 (80 participants). He discussed “Deer repellents” at the tobacco growers’ meeting, South Windsor, March 12 (100 participants). He spoke on “Beech leaf disease and spotted lanternfly,” at the Apgar distributor’s educational program for landscape professionals, Danbury, March 19 (100 participants). He presented “Facts and fallacies of organic agriculture” to the Wethersfield Men’s Garden Club, March 24 (20 participants).

**ROSE HISKES** gave a talk on “Invasive Plants: The Silent Invaders” at the Flanders Eco-Landscaping Series at the Flanders Nature Center in Woodbury (March 24)(22 adult attendees).

**MICHELLE SALVAS** presented an overview of the tobacco cyst nematode at the Tobacco Research Meeting in Somers, CT (100 attendees) (March 12).

**NATHANIEL WESTRICK, PH.D.** presented a seminar on the identification and management of oak wilt to the CT Forest Health Meeting (50 adults)(March 11); organized the 2025 Connecticut Valley Tobacco Research Meeting in Somers, CT and presented a seminar on the major disease management updates for the region from the 2024 growing season (100 adults)(March 12); travelled to Davis, CA to review research proposals for the Pierce's Disease & Glassy-winged Sharpshooter Board as a part of a larger initiative to control major insect, bacterial, and viral pests/pathogens of grapevine (7 adults)(March 17); worked a table at Ag Day with other station staff to discuss the various outreach and research activities going on at CAES with legislators and the public (400 adults)(March 19); presented a seminar entitled "Combating Phytophthora in Cucurbits" to the 2025 Annual Vegetable Growers Meeting in Windsor Locks (50 adults)(March 25); participated in the 2024 Connecticut Farm Winery Education Symposium hosted in Jones auditorium at CAES (35 adults)(March 27).

### GRANTS:

**CAROLE CHEAH, PH.D.** was awarded 3 grants in February 2025 to implement hemlock woolly adelgid biological control for the Wild and Scenic Upper Farmington through the Farmington River Coordinating Committee (\$12,625.50 and \$1,500) and for the Wild and Scenic Lower Farmington from the Lower Farmington Salmon Brook Wild and Scenic Committee (\$15,150)



**NATHANIEL WESTRICK, PH.D.** received a grant (\$37,101) from the Northeastern IPM Center for a research project entitled "Optimizing IPM Tools to Manage Anthracnose Crown Rot of Strawberry in the Northeast"

### **PUBLICATIONS:**

Clive M. Brasier, Niklaus J. Grünwald, Tyler B. Bourret, Francine Govers, Bruno Scanu, David E.L. Cooke, Tanay Bose, David L. Hawksworth, Z. Gloria Abad, M. Victoria Albarracin, ..... **DeWei Li** .....etc. (2025). Preserving the biologically coherent generic concept of *Phytophthora*, 'Plant Destroyer'. *Phytopathology* First look <https://doi.org/10.1094/PHYTO-11-24-0372-LE>

**Abstract:** *Phytophthora* is a long-established, well known and globally important genus of plant pathogens. Phylogenetic evidence has shown that the biologically distinct, obligate biotrophic downy mildews evolved from *Phytophthora* at least twice. Since, cladistically, this renders *Phytophthora* 'paraphyletic', it has been proposed that *Phytophthora* evolutionary clades be split into multiple genera (Runge et al. 2011; Crous et al. 2021; Thines et al. 2023; Thines 2024). In this letter, we review arguments for the retention of the generic name *Phytophthora* with a broad circumscription made by Brasier et al. (2022) and by many delegates at an open workshop organized by the American Phytopathological Society. We present our well-considered responses to this proposal in general terms and to the specific proposals for new genera; together with new information regarding the biological properties and mode of origin of the *Phytophthora* clades. We consider that the proposals for new genera are mostly non-rigorous and not supported by the scientific evidence. Further, given (1) the apparent lack of any distinguishing biological characteristics (synapomorphies) between the *Phytophthora* clades; (2) the fundamental monophyly of *Phytophthora* in the original Haeckelian sense; (3) the fact that paraphyly is not a justification for taxonomic splitting; and (4) the considerable likely damage to effective scientific communication and disease management from an unnecessary break-up of the genus, we report that Workshop delegates voted unanimously in favour of preserving the current generic concept and for seeking endorsement of this view by a working group of the International Commission on the Taxonomy of Fungi.



The 2025 Connecticut Valley Tobacco Research Meeting in Sommers, CT organized by **Dr. Nate Westrick** on March 12. Photo by **DeWei Li**



**Aulakh, J. S.,** Kumar, V., Mohanpuria, R. Christmas Tree Tolerance and Weed Control with Postemergence Application of Topramezone. *HortTechnology*.

Brasier, C. M., Grünwald, N. J., Bourret, T. B., Govers, F., Scanu, B., Cooke, D. E. L., Bose, T., Hawksworth, D. L., Abad, Z. G., Albarracin, M. V., **Li, D.-W.** ...etc. Preserving the Biologically Coherent Generic Concept of Phytophthora, 'Plant Destroyer'. *Phytopathology*.

Donahey, E. C. and **Fisher, K. E.** Efficacy of human-managed milkweed (*Asclepias* sp.) dispersal methods to support monarch butterfly (*Danaus plexippus*) conservation. *Journal of Insect Conservation*.

**Hiskes, R.** Scarce Straw Pearl Moth, *Paracorsia repandalis*, Crambidae Found Feeding on Mullein, *Verbascum thapsus* in Connecticut. *CAES Fact Sheet*.

Irewale, A. T., Elemike, E. E., **Dimkpa, C. O.,** Oguzie, E. E. Molecular Modelling of Biochar-ZnO-CuO Nano-biofertilizer: Adsorption Simulation for Optimized Nutrient Delivery. *Biochar*.

Jia, J., Guo, Y., Wei, D., **White, J. C.,** Saleem, K., Yu, H., Li, M., Wang, Y., Song, C. Mitigating cadmium stress in soybeans: Seed priming with nanoscale TiO<sub>2</sub> and ZnO for safer crop production. *Journal of Agricultural and Food Chemistry*.

Jilling, A., Grandt, S., Daly, A., Hestrin, R., Possinger, A., Abramoff, R., Cates, A., Dynarsky, K., Georgiou, K., Heckman, K., Keiluweit, M., Lang, A., Philips, R., Rocci, K., **Shabtai, I.,** Sokol, N., Whalen, E. The ecological relevance of fast-cycling mineral-associated organic matter – a dynamic pool of 'persistent' soil carbon and nitrogen. *Global Change Biology*.

**Li, Y. and Millett, F.** Seed Germination and Purity Analysis 2024. *CAES Technical Bulletin*.

Mantack, D. P. and **Zarrillo, T. A.** First Record of *Melitta eickworti* Snelling and Stage (Hymenoptera: Apoidea: Melittidae) in Connecticut, USA. *Specimen*.

Miles, C., Shcherbatyuk, N., Weiss, B., Yu, Y., Gull, N., Williams, A., DeVetter, L. W. Frequently Asked Questions about Soil-Biodegradable Plastic Mulches. *HortTechnology*.

Onyeka, E. U., Ukpong, S. E., **Dimkpa, C. O.,** Azudialu, B. C. Unlocking the Nutritional Potential of GABA Rice: Towards a Sustainable Approach to Metabolic Disorder Remedies. *ACS Food Science and Technology*.

**Pavlicevic, M., Zhou, J., Ammirata, M. A., Arsenault, T., Cahill, M. S.,** Hernandez-Viezcas, J. A., Oyanedel-Craver, V., Gardea-Torresdey, J., **Dimkpa, C. O., White, J. C., Zaverza-Mena, N.** Manganese nanoparticles synthesized from hemp biomass waste modulate metabolic responses in soybean. *Plant Physiology and Biochemistry*.

Powell J. R., **Gloria-Soria A.,** Soghigian J. Recognition of Mosquito Subspecies: The Case for



*Aedes aegypti* (Diptera: Culicidae). *Journal of Medical Entomology*.

**Rutledge, C. E.** and Brophy, N. New Host Record for *Drosophila suzukii*: *Asimina triloba* (Annonaceae: Magnoliales). *Proceedings of the Entomological Society of Washington*.  
Stewart et al. Emerging Issues and Research Opportunities in Vadose Zone Processes. *Vadose Zone Journal*.

Wang, X., Hussain, B., Zou, T., Huang, X., Cheng, L., Wu, Z., Yang, Y., Li, Y., Hen, X., Lian, J., **White, J. C.**, Yang, X. Fate and physiological effects of foliar selenium nanoparticles in wheat. *ACS Nano*.

**Whittinghill, L. J.** The Effects of Annual Compost Addition to Agricultural Green Roofs on Media Properties. *Ecological Engineering*.

Zhou, J., Tang, C., Xiao, M., Ge, T., Luo, Y., Dong, Y., Yu, B., Cai, Y., **White, J. C.**, Li, Y. Nitrogen-induced suppression of methane accumulation is counteracted by biochar in a subtropical forest soil. *Applied Soil Ecology*.



# CAES

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