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. met by Teams with colleagues at Taylor and Francis to discuss the status of the International Journal of Phytoremediation (I am Editor-in-Chief) (November 3); met by Teams with colleagues at the University of Minnesota to discuss a collaborative grant proposal (November 3); chaired a Teams meeting of the CAES Board of Control Executive and Finance Committee meeting (November 3); attended the 2025 American Institute of Chemical Engineers (AIChE) Annual Meeting, in Boston and gave a presentation entitled "Nanotechnology-based strategies for enhanced phosphorus and nitrogen deliver to crop species" (November 3-5); participated by Teams in the Farmland Preservation Advisory Committee meeting (November 6); participated in a Teams call with colleagues from the University of Minnesota and 3M to discuss collaborative PFAS phytoremediation research (November 6; 13; 20); met by Teams with colleagues at the University of Minnesota, Convergent Bioscience, and Connecticut Innovations to discuss collaborative projects (November 7;); attended the CANVAS 2025 Annual Meeting in Salt Lake City, Utah and gave a presentation entitled "Nanotechnology-based strategies for enhanced phosphorus and nitrogen deliver to crop species" and served as a session chair for a series of platform presentations focused on the USDA Closer to Zero initiative (November 9-12); met by Teams with colleagues at the University of Minnesota and Convergent Bioscience to discuss collaborative projects (November 14; 28); along with **Sudhir Sharma, Ph.D.** participated in a ZOOM call with colleagues at Columbia University to discuss progress on a collaborative USDA grant (November 18); attended the CT Farm Bureau annual meeting in Wallingford CT at the Farms Country Club and accepted formal recognition of the contributions of the CAES over the last 150 years (November 19); attended the Federated Garden Club of CT annual meeting in Jones Auditorium to accept recognition and a financial contribution to the CAES for its support of the organization's activities (November 19); participated by ZOOM in the PhD proposal defense of a University of Maryland Baltimore Country graduate student (November 19); participated by Teams in the bi-monthly AgInnovation Northeast call (November 20); along with **MICHAEL LAST** hosted the monthly CAES j-visa recipient meeting (November 21); gave a presentation by ZOOM to the Graduate Seminar in Environmental Engineering at Texas A & M University entitled "Nano-enabled agriculture: A path to global food security in a changing climate" (November 22); participated by Teams in a meeting of the Organizing Committee for the 2026 International Phytotechnology Society meeting to be held in Providence Rhode Island in October 2026 (November 24); met by Teams with Professor Yiming Sun of the Utah State University to discuss collaborative research (November 25); hosted Professor Katherine Owens of the University of Hartford for the bi-weekly CAES Seminar Series (November 26);

PUBLICATIONS:

1. Badr-Eddine, C.; El Idrissib, A.; Lazaar, A.; **White, J. C.**; Kebede, F. 2025. MXenes as emerging nanomaterials for sustainable agriculture: A review. *Sci. Tot. Environ*. 1009:181068

Abstract: MXenes, a novel class of two-dimensional transition metal carbides, nitrides, and carbonitrides, have gained increasing attention in agriculture due to their unique physicochemical properties, including high conductivity, tunable surface chemistry, and exceptional adsorption capabilities. This review explores the role of MXenes in agricultural ap-

plications, focusing on biosensing, soil enhancement, pollutant remediation, and crop protection. The high surface area and hydrophilicity of MXenes make them suitable for precision agriculture, enabling real-time monitoring of soil nutrients, pesticide residues, and heavy metal contamination. Moreover, their antimicrobial and catalytic properties offer promising solutions for soil pollution remediation, reducing the adverse impact of agrochemicals on ecosystems. However, challenges such as stability, potential toxicity, and large-scale synthesis must be addressed to ensure their safe and sustainable integration into agricultural systems. This review provides the latest advances in MXenes application to agriculture for the advantage of scientists and policymakers who are interested in leveraging MXenes to enhance agricultural productivity while mitigating environmental risks. Future research directions necessitate to optimize the use of MXenes in precision agriculture in an attempt at addressing global food and nutrition security.

2. Liu, M.; Das, A.; Zuverza-Mena, N.; Musante, C.; **White, J. C.**; Terry, L.R.; Guo, H. 2025. Tracking micro-nanoplastic removal from edible vegetable leaves through in-situ confocal surface enhanced and normal Raman imaging. *J. Food Comp. Anal.* 148:108644.

Abstract: Micro and nano-plastics (MNPs) have become a significant contamination concern. In agriculture, MNPs contaminate edible plants through different environmental pathways, threatening food safety and human health. The efficacy of commonly used post-harvest cleaning methods for mitigating this exposure remains largely unexplored. This study assessed the removal of microplastics (42 µm polystyrene and 6 µm polymethyl methacrylate) using in-situ confocal Raman spectroscopy, and nanoplastics (61 nm polystyrene) using a novel dual-detectable nanoplastic tracer for both confocal Surface-Enhanced Raman Spectroscopy (SERS) and Inductively Coupled Plasma Mass Spectrometry (ICP-MS) analysis. Our results reveal that while tap water washing effectively removed 42 µm polystyrene MPs (Removal efficacy (RE) = 93.6 ± 3.6 %), its performance significantly declined for 61 nm polystyrene NPs (RE = 16.5 ± 0.6 %). Detergent-based washing proved most effective for 6 µm polymethyl methacrylate MPs (up to RE = 73.8 ± 0.9 %), and sonication emerged as the most promising method for NP removal (RE = 59.8 ± 0.6 %). By integrating high-resolution Raman and SERS imaging with ICP-MS quantification, this work offers a novel framework for evaluating fresh produce plastic contamination. Our findings highlight the urgent need to develop more effective post-harvest practices to limit dietary exposure to plastic particles.

3. Kong, M.; Jing, H.; Yang, J.; Liu, X.; Shen, Y.; **White, J. C.** 2025. Size-engineered magnetite nanoparticles protect rice from Fusarium graminearum via direct antifungal activity and immune activation. *Commun. Earth Environ.* https://doi.org/10.1038/s43247-025-03055-w.

Abstract: Fusarium diseases threaten global food security through crop losses and toxin contamination, exacerbated by fungicide resistance and climate change. Here we demonstrate that magnetite (iron oxide) nanoparticles provide size-dependent protection against Fusarium graminearum in rice through dual antifungal and immunity mechanisms. Using antifungal assays, root iron layer analysis, and pathogen challenges under controlled and soil-based conditions, we evaluated 5 and 10 nanometer magnetite nanoparticles. Results reveal pronounced size-dependent activity, with 5 nanometer particles achieving 67.4% fungal inhibition in vitro versus 44.6% for 10 nanometer particles. In agricultural trials, 5 nanometer nanoparticles at 1.0 milligrams per liter reduced disease area by 82.7%, outperforming 10 nanometer particles (67.5%) and ionic iron (43.8%). The nanoparticles en-

hanced protective iron layers on roots and activated plant defense, increasing defense hormones 2.8–3.5-fold. Gene expression analysis revealed upregulation of plant immunity and antimicrobial compound pathways. Size-engineered magnetite nanoparticles offer promising sustainable alternatives to conventional fungicides.

4. Ivanchenko, P.; Ghribi, S.; Degli Esposti, L.; Adamiano, A.; Iafisco, M.; Sakhno, Y.; Yuan, J.; Steven, B.; Zuverza-Mena, N.; **White, J.C**.; Jaisi, D. 2025. Dissolution of micronutrient-doped amorphous calcium phosphate nanoparticles in organic acids: Tunability and greenhouse performance. *ACS Agric. Sci. Technol*. https://doi.org/10.1021/acsagscitech.5c00626.

Abstract: Modern agriculture faces significant challenges in meeting global sustainability goals because conventional phosphorus (P) fertilizers dissolve prematurely and risk substantial runoff. Among slow-release fertilizers, amorphous calcium phosphate (ACP) offers a promising alternative to address both issues due to the slow and sustained P release, customizable properties, and not altering soil pH. Here, we investigated the dissolution properties of citrate-stabilized amorphous calcium phosphates (ACPc), both in pure form and doped with plant micronutrients (S, Fe, Zn, and Cu). Analysis of dissolution in 0.01 M citric and acetic acid buffers (pH 4.8) through dissolved ions and residual content analysis using ICP-OES, XRD, FTIR, and Raman spectroscopy methods showed that all materials maintained their amorphous structure, but ion-doping delayed the transformation of citrate-stabilized ACP into apatite, although the carbonate content decreased. Citric acid buffer enhanced the element release in undoped and Fe-doped ACPcs, while P release among doped materials remained almost unchanged. The acidity, complexation properties of acid buffers, and structural strain inherent within the material significantly influenced solubility, thereby affecting the dissolution behaviors. A greenhouse pot experiment performed to test the efficacy of doping ACPc on plant nutrition showed that corn (Zea mays) response was variable for micronutrient use efficiency: highest normalized uptake of Cu, high Zn shoot translocation, but poor Fe uptake to roots and shoots during the vegetative growth stage. Micronutrient doping affected both the material stability and dissolution kinetics, which are also reflected in the nutrient uptake by the corn plants. Overall, these outcomes provided useful insights for optimizing the delivery of P and micronutrients to agricultural plants.

5. Zhou, J.; Tang, C.; Jiang, Z.; Xiao, M.; Fang, Y.; Ge, T.; Luo, Y.; Liu, S.; Dong, Y.; Yu, B.; Cai, Y.; **White, J.C**.; Li, Y. 2025. Biochar alleviates ammonium-induced suppression of methane uptake in a subtropical forest soil. *Chem. Engin. J.* 526:171024.

Abstract: Forest soils are critical sinks for ambient atmospheric methane (CH4), yet anthropogenic nitrogen (N) inputs frequently suppress this uptake capacity. The application of biochar is increasingly regarded as a promising countermeasure, although uncertainties remain regarding the influence of pyrolysis temperature and its interactive effects with specific forms of N. This study elucidates how the biochar pyrolysis temperature modulates N-form-dependent CH4 uptake dynamics in subtropical forest soils. Through a controlled microcosm experiment covering various N regimes (no exogenous N, ammonium-N, and nitrate-N) and biochar (no biochar, biochar pyrolyzed at 300 °C and 500 °C), we demonstrated that ammonium suppressed the uptake of CH4 by 28 % (relative to the control), whereas nitrate had a neutral impact. Conversely, both biochar amendments enhanced the uptake of CH4, where biochar pyrolyzed at 500 °C exhibited a 45 % greater uptake than control, outperforming the 300 °C biochar's 22 % enhancement. Notably, ammonium-amended soils co

-treated with 500 °C-pyrolyzed biochar achieved an 88 % greater CH4 uptake than ammonium-only systems through multiphasic regulation: (i) reducing labile N availability; (ii) diminishing the abundance of methanogenic mcrA gene; (iii) elevating labile C pools; (iv) enhancing methanotrophic pmoA gene abundance. These biogeochemical modifications suppressed CH4 production (methanogenesis) and promoted CH4 oxidation (methanotrophy), yielding a higher net CH4 uptake. This study highlights the promising role of biochar (particularly when produced under higher temperatures) to reinforce the resilience of CH4 sinks under N enrichment, thereby advancing technological innovations to enhance soil CH4 sequestration in managed forest ecosystems.

6. Liu, M.; Das, A.; **Zuverza-Mena, N.; Musante, C.; White, J.C**.; Wang, C.; Terry, L.; Guo, H. 2025. SERS Imaging and ICP-MS quantification of the biological uptake of nanoplastics using a dual-detectable model material. *J. Hazard. Mat.* 500:140520.

Abstract: Nanoplastics (NPs) pose significant concerns to human health due to their wide environmental presence and high potential for biological uptake, transport, and accumulation. Conventional analytical methods for studying NP-biota interactions suffer from low accuracy and precision due to limited reliability and quantitative capability. To address these challenges, a dual-detectable NP material was developed that allows for in-situ imaging by surface-enhanced Raman spectroscopy (SERS) and ex-situ quantification by inductively coupled plasma-mass spectrometry (ICP-MS). Here, a model NP that has a core-shell structure with Raman reporter-functionalized gold nanoparticles as the core and a layer of plastic as the shell was synthesized. The model polystyrene (PS) NPs demonstrated stability in structure, morphology, size, and surface charge over one year, with no indication of constituent leaching because of the covalent bonding of the Raman indicator to the Au core, ensuring stable signals and enabling reliable long-term monitoring in complex biological systems. The model NPs remained stable in suspension over 24 h without observable precipitation. A single model NP was successfully detected by SERS, indicating the single-particle detection capability of this approach. Further, garlic (Allium sativum) was used as a biological model to evaluate the potential of using the dual-mode detectable model NPs to study NP-biota interactions. Garlic roots exposed to PS NPs for 30 days at 2×10^9 and 2×10^{10} particles/mL accumulated average particle counts of 1.9×10^7 and 2.3×10^8 particles per plant, respectively. At the highest tested concentration (2×10^{11} particles/mL), uptake increased to 2.4×10^9 particles per plant as quantified in root tissues. These results confirm a concentration-dependent uptake pattern. NP uptake by garlic roots further increased under longer exposure periods. ICP-MS quantification confirmed the presence of model NPs in roots rather than in the upper parts of the plant, as well as the concentration-dependent accumulation. This dual-mode detectable model NPs enable both semi-quantitative NP visualization via SERS imaging and accurate quantification analysis through ICP-MS, serving as a powerful tool for studying the biological uptake, transport, and accumulation of NPs. Their use can significantly improve our understanding of their fate and effects on biota in the future.

7. Zhou, J.; Zuverza-Mena, N.; Dimkpa, C.O.; White, J.C. 2025. Copper-based materials mitigate salinity stress in hydroponically grown lettuce (*Lactuca sativa* L.). *Biosci. Nanotechnol.* 1:6.

Abstract: As water scarcity persists, alternative irrigation methods, such as water reuse in agriculture, will be adopted, though often limited by high salinity levels. Hence, the potential of copper to mitigate salinity stress in lettuce (*Lactuca sativa* L.) was evaluated. Plants were grown hydroponically and exposed to moderate (100 mM) or elevated (150 mM) salinity (as NaCl), either alone or in combination with foliar applied copper-based materials,

including copper oxide nanoparticles (nCuO), bulk copper oxide (bCuO), copper sulfide nanoparticles (nCuS), or copper sulfate ($CuSO_4$). Under moderate salinity, the Cu-based materials were applied at 25 and 100 mg L^{-1}, while for high salinity, only the 25 mg L^{-1} Cu treatment was used. Foliar application of 25 mg L^{-1} nCuO, nCuS, or $CuSO_4$ effectively mitigated salinity-induced growth inhibition under both salinity conditions. Additionally, 25 mg L^{-1} nCuS significantly increased the chlorophyll content of salt-affected plants by 305% ($p < 0.005$) and 92.9% ($p < 0.001$) under moderate and elevated salinity conditions, respectively, compared to untreated salinity controls. In addition, shoot phosphorus and potassium uptake were significantly increased by 25 mg L^{-1} nCuO compared to the moderate salt-stressed controls ($p < 0.05$). Furthermore, moderate salinity induced oxidative stress and lipid peroxidation, as indicated by a 52% increase in malondialdehyde (MDA) content. One hundred mg L^{-1} nCuO and nCuS significantly decreased MDA by 45% and 38% ($p < 0.05$), respectively. This study demonstrates a concentration- and Cu-type-dependent role of Cu in reducing the adverse effects of salinity stress in lettuce plants under hydroponic conditions. The consistency of the findings under both moderate and elevated salinity conditions highlights the robustness of Cu-based treatments in mitigating salt stress in lettuce.

8. Majumdar, S.; Bazina, L.; DeLoid, G.; Garcia, A.G.; Zuverza-Mena, N.; Konkol, J.; Verzi, M.; Tsilomelekis, G.; **White, J.C**; Demokritou, P. 2025. Impact of UV-aging on the toxicity and bioavailability of inductively coupled plasma mass spectrometry (ICP-MS)-traceable core-shell polystyrene nanoplastics in an in vitro triculture small intestinal epithelium model. *Toxics* 13(11), 939.

Abstract: A major bottleneck in evaluating the environmental health implications of micro-nanoplastics (MNPs) is the inadequacy of analytical techniques for their precise quantification within complex environmental and biological matrices. Additionally, there is a conspicuous paucity of studies addressing environmentally relevant, photo-aged MNPs. In this study, the effects of UV aging on toxicity and bioavailability were investigated utilizing inductively coupled plasma mass spectrometry (ICP-MS)-traceable 25 nm gold-core polystyrene shell nanoplastics (AuPS25 NPs) and a triculture small intestinal epithelium (SIE) model coupled with simulated digestions to mimic physiological bio-transformations post-ingestion. Employing dynamic light scattering (DLS), transmission electron microscopy (TEM), Fourier-transform infrared spectroscopy (FT-IR), and X-ray photoelectron spectroscopy (XPS), the physicochemical and morphological alterations of AuPS25 NPs as a function of UV exposure time were investigated, revealing significant photo-oxidation within 14 days. Toxicological evaluations demonstrated that, contrasting with un-aged AuPS25 NPs, the digesta from UV-aged AuPS25 NPs at oral concentrations of 4 and 40 µg/mL weakened barrier integrity by ~15% and ~18% and heightened cytotoxicity by ~4.3% and ~5.4%, respectively. Although the NP translocation rates were similar for both aged and un-aged PS NPs, the uptake by SIE of aged AuPS25 NPs was significantly higher, reaching 72.2% at 4 µg/mL and 59.2% at 40 µg/mL. In contrast, less than 0.5% of the un-aged PS NPs at both 4 µg/mL and 40 µg/mL were taken up by SIE. These findings highlight the imperative to integrate environmentally aged MNPs into toxicological assessments, as they facilitate "real-world" MNPs. Finally, the use of ICP-MS-traceable core–shell MNPs enables the identification and quantification of PS MNPs in cell lysates and biological media via ICP-MS, showcasing the use of such a tracer MNP approach in cellular uptake and in vivo biokinetic studies.

9. Bui, T.H.; Kaur, M.; Zuverza-Mena, N.; Nason, S.; Dimkpa, C.O.; Jones, J.P.; **White,**

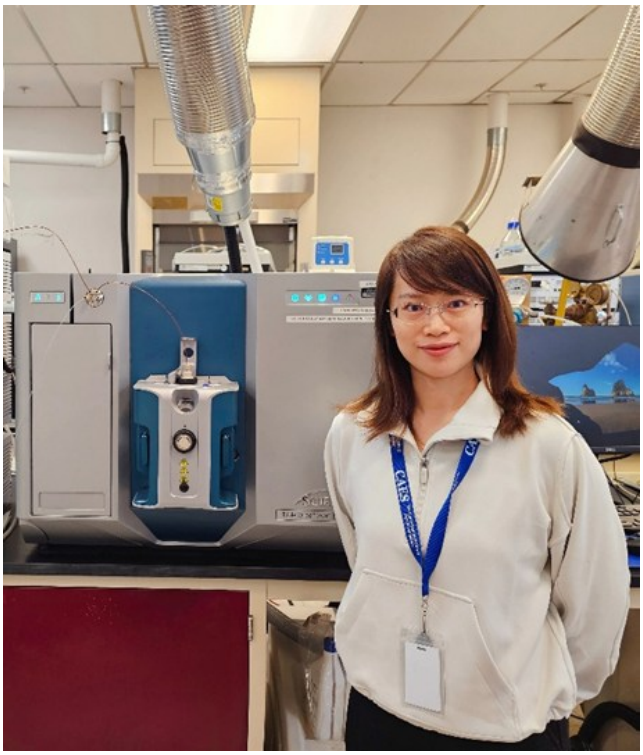
J.C. 2025. Iron-fortified hemp-derived biochar reduces per- and polyfluoroalkyl substances bioaccumulation in radish (*Raphanus sativus* L.). *Environ. Biogeochem. Proc.* 1: e010 doi: 10.48130/ebp-0025-0010.

Abstract: Per- and polyfluoroalkyl substances (PFAS) in soil are a global concern because of their persistence and adverse effects on environmental health and food safety. Biochar (BC) is a cost-effective sorbent that could immobilize PFAS in soil, potentially reducing bioavailability to food crops. This study examined the capability of hemp-derived BC to immobilize PFAS in a field soil contaminated with legacy firefighting foams. The soil contained a PFAS concentration of 575.66 ± 117.08 ng/g, with a notably high PFOS concentration of 349.60±107 ng/g. BC produced at 500-800 o C and fortified with iron at 8% w/w, was incorporated into soil at 2 or 5 wt.% (wt.-weight) to examine impacts on PFAS leaching (90-d incubation period) and PFAS bioaccumulation in radish (Raphanus sativus L.). BC produced at 500 °C had the highest surface area (232.90 m2/g) and demonstrated superior performance in retaining PFAS in soil, achieving 6.9 and 33.9% reductions of PFAS in leachate at 2 and 5wt.% soil amendment, respectively. Incorporation of iron into BC through precipitation provided additional PFAS sorption sites, resulting in a 70.3% and 78.6% reduction in PFAS leaching at 2 and 5% amendment. Specifically, PFOS leaching was reduced by 67.40% and 77.30% at 2 and 5% amendment, respectively. PFAS accumulation in radish whole plants (shoot+ bulb) were reduced by 45.90% when grown in soil amended with iron-fortified BC produced at 500°C as compared to unamended soil. Importantly, radish bulb showed 25.70% less PFAS bioaccumulation, with notable efficacy for short-chain sulfonic acids (26.90–63.90%) and carboxylic acids (29.50–56.80%). Collectively, these findings underscore the potential of BC, particularly when fortified with iron, to mitigate the risks of PFAS contamination in agricultural soils and to promote food safety.

ANALYTICAL CHEMISTRY

CHRISTIAN DIMKPA, PH.D. and **Paul Aikpokpodion, Ph.D.** attended the 14th Sustainable Nanotechnology Organization (SNO) annual conference entitled Next-generation Applications of Nanotechnology for Optimal sustainability (NANO) Conference in San Diego, California. The conference was jointly organized by SNO & the International Water Association (IWA) during November 7-9, 2025. **Dr. Dimkpa** chaired the session on Nano-Bioeconomy: Agriculture, Energy, Food, and the Allied and also gave an oral presentation entitled "Green" solution to root-knot nematode problem. **Dr. Aikpokpodion** gave an oral presentation of a USDA-NIFA funded research on phosphorus management entitled Enhancing phosphate rock fertilizer with Nano-sulfur biopolymeric coatings for sustainable agriculture.

Wei Jing, Ph.D. joined CAES on November 14, 2025, as a visiting scholar. Her professional background is in soil pollution control. She received her bachelor's degree from Central South University China, and her doctoral degree from the Nanjing Institute of Soil Science, Chinese Academy of Sciences. She is currently employed at the Nanjing Institute of Environmental Sciences, Ministry of Ecology and Environment, where she serves as the head of the Innovation Team for Soil Pollution Risk Assessment and Green Remediation. At CAES, her current research focuses on the development of phytoremediation-based technologies for PFAS and associated enhancement strategies.



PUBLICATIONS:

1. Zhou, J., Zuverza-Mena, N., Dimkpa, C.O., White, J.C. (2025). Copper-based materials mitigate salinity stress in hydroponically grown lettuce (*Lactuca sativa* L.). Bioscience Nanotechnology (2025) 1:6. DOI: https://doi.org/10.1186/s44331-025-00006-2

2. Onyeka, E.U., Ukpong, S.E., Azudialu, B.C., Ndindeng, S.A., Senthilkumar, K., **Dimkpa, C.O.,** (2025). Unlocking the nutritional potential of gamma amino butyric acid (GABA) rice: towards a sustainable approach to metabolic disorder remedies. Food Science and Nutrition, DOI https://doi.org/10.1002/fsn3.71284

ENTOMOLOGY

PHILIP ARMSTRONG, SC.D. interviewed by NBC CT about the impact of climate change on mosquito populations and arbovirus transmission (November 12). Along with **Drs. Goudarz Molaei, Doug Brackney,** and **Jonathan Karisa**, met with Min Huang from the DEEP Migratory Bird Program to discuss a collaborative project on the enzootic transmission of EEE virus in avian populations (November 21).

ANGELA BRANSFIELD participated in a CAES DEI meeting (November 17); participated via Zoom in Yale University's Biosafety Committee meeting (November 20).

KELSEY E. FISHER, PH.D. Attended and participated in the Entomological Society of America conference in Portland, OR from November 8-12, 2025; organized and facilitated a meeting: "NC246 multistate research workshop on *Bacillus thuringiensis* resistance in European corn borer"; presented "Impacts of common milkweed (Asclepias syriaca) leaf age on larval monarch (*Danaus plexippus*) growth, development, and feeding behavior, and the implications for conservation management"; Co-authored presentations: "Perspectives on the ecology and evolution of *Bacillus thuringiensis* resistance in European corn borer", "Assessing diamide effects on monarch butterflies in lab and greenhouse settings", "Native bees and plant-pollinator interactions in Farm Bill conservation plantings", "Spotted lanternfly dispersal and reproductive stage: Using stable isotope mark and recapture and flight mill studies to study adult movement", "Influence of land cover on wild bee communities in pollinator meadows in southern New England", and "Zooming out: How do small pollinator gardens support bumble bee (*Bombus* spp.) success in fragmented landscapes?"

ANDREA GLORIA-SORIA, PH.D. Dr. Gloria-Soria gave the lecture "Population genetics for vector control" at Southern Connecticut University (November 4), as part of their BIO337 course; attended the Entomological Society of America Annual meeting in Portland, OR (November 8-12) and presented the talk "Population genetics of *Culex pipiens* in the Northeast" as part of the NE2443 Multistate Annual Symposia on Biology and Management of Emerging Disease Vectors (November 12).

MEGAN LINSKE, PH.D. hosted the Women and Family Life Center's EmpowHer: Girls in STEM program final session as Lead Facilitator (November 1); gave an invited presentation to the Connecticut Rose Society titled "Ticks and Tick-Borne Diseases in Connecticut: Understanding Risks and Management for Homeowners" (20 attendees) (November 2); gave a presentation at the Entomological Society of America's Multistate Hatch Meeting titled "Optimization of Integrated Tick Management Strategies" (25 attendees) (November 12) (Portland, OR); 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 (November 19).

GOUDARZ MOLAEI, PH.D. met with Dr. Nasa Sinnott-Armstrong, an assistant professor within the Herbold Computational Biology Program of the Public Health Sciences Division, to discuss joint project on Lyme disease leveraging the CAES Tick Testing Laboratory database (Nov. 7); attended the NEVBD TEC trainees' seminar (Nov. 12); attended the Global Consortium on Climate and Health Education at the World Health Organization (WHO) EMRO region to plan a training course on climate change and public health

(including vector-borne diseases) in 2026 (Nov. 12 and 26); met with the staff of Suffolk (VA) Mosquito Control to discuss the ongoing joint projects (Nov. 14); and lectured a topic on tick-borne diseases at SCSU as part of the CAES contribution to the CDC NEVBD TEC grant objectives in training the next generation of vector-borne disease experts (Nov. 17).

GALE. E. RIDGE, PH.D presented a talk about the history of The Connecticut Agricultural Experiment Station at the Bruce Museum in Old Greenwich (November 2, 37 attendees); Zoom interviewed by University of Connecticut Entomology students about the spotted lanternfly for a project (November 4); consulted via TEAMS by Western Connecticut Mental Health Network with staffs from Danbury, Waterbury, and Torrington dealing with intractable bed bug issues associated with the elderly and disabled where housing authorities and landlords are failing in their obligations (November 13, 16 staff); and participated in a NAISMA online training on the use of AI and drone technology against invasive species (November 19).

JOHN SHEPARD participated in an online meeting of the Board of Directors of the Northeastern Mosquito Control Association (November 3); presented the invited lecture "Mosquito Control and Prevention of Mosquito-Borne Disease Transmission" to undergraduate students at Southern Connecticut State University (November 10) (approx. 20 attendees).

TRACY ZARRILLO participated in a meeting of the Pollinator Advisory Committee (November 5); presented a talk titled "Who are Connecticut's Specialist Bees" at the UCONN Plants and Pollinators Conference om Storrs (November 13) (approx. 260 attendees); met with emeritus **Dr. Chris Maier** to discuss a future collaboration (November 24); met with Michael Veit and Spencer Hardy of the Vermont Center for Ecostudies to discuss a regional bee manuscript (November 25).

This fall, **DR. MEGAN LINSKE** (Department of Entomology) partnered with the Women and Family Life Center in Guilford, CT to cohost the EmpowHer: Girls in STEM Program, a six-week pilot initiative funded by a grant from the Guilford Fund for Education. The program welcomed 15 enthusiastic 5th and 6th grade girls and concluded at the beginning of November.

Throughout the session, participants engaged with STEM professionals from the University of New Haven, Medtronic, University of Connecticut 4-H Extension Center, and the Connecticut Agricultural Experiment Station. **MRS. SUMMER WEIDMAN** and **DR. JEREMIAH FOLEY IV** (Department of Environmental Science and Forestry) led a dynamic workshop on aquatic invasive species with a focus on hydrilla management. **DR. JESSICA BROWN** and **MS. NATALIE BAILEY** (Department of Environmental Science and Forestry) as well as Ms. Halie Shea (University of Connecticut 4-H Extension Center) delivered an interactive wildlife biology and management workshop that introduced the girls to animal tracks, wildlife signs, and how biologists study animals in the field.

The program's inaugural run was well received, with interest exceeding available spots, and plans are already underway to offer the next session in Spring 2026.

Additionally, the program was featured in several media outlets, including CT Insider and the Guilford Courier.

Dr. Megan Linske conducting a science experiment with EmpowHer: Girls in STEM participants.

Ms. Hailie Shea, Ms. Natalie Bailey, and Dr. Jessica Brown leading a discussion on wildlife identification.

Dr. Jessica Brown assisting participants with creating their own wildlife track molds.

Dr. Jeremiah Foley IV and Mrs. Summer Weidman discussing hydrilla monitoring and management with participants.

Mrs. Summer Weidman showing participants the drone used for aquatic invasive monitoring.

ENVIRONMENTAL SCIENCE & FORESTRY

SCOTT C. WILLIAMS, PH.D. participated in a Zoom meeting with staff from White Buffalo, Inc. and Massachusetts stakeholders to discuss utilization of host-targeted systemic acaricide treatment as a means to areawide tick reduction (November 3); 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 (November 4); participated in a Zoom meeting hosted by **MEGAN LINSKE, PH.D.** with University of Liverpool professor Caroline Millins, Ph.D. and Ph.D. student Aaron Sambrook regarding the experimental systemic acaricide treatment of rodents as a potential areawide tick management strategy in peridomestic habitats on the Isle of South Uist, Scotland (November 6); participated in an evidentiary hearing and evening public comment session of the State of Connecticut Siting Council (November 6); chaired the evening meeting of the Town of Guilford Land Acquisition Commission (November 6); attended the Annual Entomological Society of America conference in Portland, OR (November 8 – 13) and presented invited lecture titled "Blacklegged ticks and Japanese barberry: An ecological perfect storm" (60 attendees) (November 12); participated in a Zoom meeting with staff from White Buffalo, Inc. and Massachusetts stakeholders to discuss utilization of host-targeted systemic acaricide treatment as a means to areawide tick reduction (November 14); 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 (November 18); participated in an evidentiary hearing and evening public comment session of the State of Connecticut Siting Council (November 18); presented invited lecture hosted by Earthplace (Westport, CT) titled "Deer and tick-borne disease: Concerns for forest and public health alike" (20 attendees) (November 18); participated in a meeting with staff from the CDC Division of Vector-Borne Diseases on progress made on a funded integrated tick management project (November 19); participated in a an evening meeting of the Town of Guilford's Conservation Commission (November 19); participated in an evidentiary hearing of the State of Connecticut Siting Council (November 20); facilitated a conversation about forest management between Ferrucci and Walicki-owner Eric Hansen and the East Haddam Fishing and Game Club (November 21); as the Connecticut representative, participated in a monthly meeting of the New England Chapter of The Wildlife Society (November 25).

NATALIE BAILEY participated in a Zoom call with BanfieldBio to discuss the development of a botanical acaricide (November 4, 18); at the Entomological Society of America annual meeting in Portland, Oregon, presented a poster with preliminary tick surveillance data from Yale University's Horse Island in Branford, CT (November 9-12).

JOSEPH P. BARSKY participated in the online meeting of the CT Forest Ecosystem Monitoring Cooperative State Partnership (November 3); participated in the Yankee Division Society of American Foresters Meeting Planning Committee Meeting (November 14); served as a judge for the 2025 CT FFA/4H State Forestry Competition at Deer Lake Outdoor Center in Killingworth (November 13).

JESSICA E. BROWN, PH.D. as an invited speaker to a Medical, Urban, and Veterinary Entomology (MUVE) Section symposium, presented a connected lightning talk and poster both titled "Advancing the systemic treatment of rodent hosts to reduce blacklegged tick (*Ixodes scapularis*) parasitism" at the Entomological Society of America's 2025 National Meeting in Portland, OR (50 attendees) (November 11).

the CAES Boardroom to discuss programmatic needs (November 17); participated in the Northeast Aquatic Plant Management Society Scholarship Committee meeting (November 20); gave a tour of the soil testing laboratory to three groups of students from the New Haven Public Schools' Off Campus Classroom Program (30 attendees) (November 21); participated in the USACE Aquatic Plant Control Cost Share Program meeting (November 24).

RILEY DOHERTY met with CT DEEP Boating Division to discuss new AIS signage at boat launches (November 6); participated in the Project Delivery Team meeting with the US Army Corps of Engineers to discuss the CT River Hydrilla Demo Project (November 12); participated in a meeting with Rep. Renee LaMark Muir to discuss the needs of the State in terms of aquatic invasive species (November 17); participated in the DEI Committee meeting (November 17); participated in the Connecticut Federation of Lake monthly board meeting (November 19); participated in the U.S. Army Corps of Engineers cost share program planning meeting (November 24).

JEREMIAH R. FOLEY, IV, PH.D. attended the North American Lake Management Society conference in Myrtle Beach, presented invited talk titled "The Potential for Classical Biological Control of Connecticut River Hydrilla" (35 attendees), co-authored technical presentation "Development of management strategies for a new hydrilla invasion on the Connecticut River," and research poster "Detecting Northern Hydrilla (*Hydrilla verticillata* subsp. *lithuanica*) in the Connecticut River using Satellite Imagery" with colleagues **GREG BUGBEE**, **SUMMER WEIDMAN**, **RILEY DOHERTY**, and **MADELINE WATTS** (November 4-6); met with State Representative Renee LaMark Muir at CAES to discuss Connecticut River hydrilla and other aquatic invasive issues facing the state (November 17); commenced third consecutive year of service on the Advisory Council for the Connecticut River Valley Environmental Summit (November 19): nominated to serve on the Board of Directors for the Northeast Aquatic Plant Management Society (November 30).

JACK HATAJIK participated in the Forest Ecosystem Monitoring Cooperative Connecticut State Partnership Meeting to discuss research priorities with state collaborators (November 7); presented a lecture on the application of forest inventories to understand current forest health and inform forest management practices for the Flanders Nature Center & Land Trust (15 participates) (November 13); met with Jordan Hillyard, Forest Health Biologist at the Rhode Island Department of Environmental Management, to discuss our state's results from the 2025 Insect and Disease Aerial Survey conducted for the USDA Forest Service (November 18); participated in the monthly Society of Ecological Restoration – Northeast Chapter Executive Committee meeting as an Emerging Professional board member (November 24).

SUSANNA KERIö, D.SC. phenotyped 1,500 oak trees planted in urban forest gaps on a research project established through the Urban Silvicultural Network studying assisted migration and adaptation of oaks (November 3, 10, 17, 24); gave invited talks on "Drought and Tree Health" and "Drought Management" during the CT Tree Protective association's Drought Symposium, and organized a field walking tour focused on field soil measurements and tree health (80 attendees) (November 14); attended a call to plan the annual "Branching Out" conference jointly organized by the CT Urban Forest Council, Tree Wardens Association of CT, and CT Tree Protective Association (November 19).

ference jointly organized by the CT Urban Forest Council, Tree Wardens Association of CT, and CT Tree Protective Association (November 19).

SARA NASON, PH.D. met virtually with colleagues and students from the University of Minnesota (Dr. Christy Haynes, Riley Lewis, and Cheng-Hsin Huang) and CAES (**DR. JASON WHITE, DR. NUBIA ZUVERZA-MENA, DR. JINGYI ZHOU**) to discuss an ongoing funded collaboration on nanomaterial enhancement of PFAS phytoremediation (November 4); as chair, led a virtual meeting for the Best Practices for Non-Targeted Analysis working group (November 4, 18); gave a virtual guest lecture on PFAS remediation for a course on phyto- and bio- remediation at The University of Massachusetts Amherst (November 6); met virtually with Emily Sigman (Dartmouth) and Eve Milusich (University of Wisconsin Madison) to discuss common research on PFAS in maple sap (November 12); met virtually with Rob Heimer and colleagues (Yale School of Public Health) to discuss collaborative research on illicit drugs in Connecticut (November 13); 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 (November 14).

ELISABETH WARD, PH.D. hosted the Forest Ecosystem Monitoring Cooperative State Partnership Committee meeting with Connecticut forestry stakeholders (15 attendees) (November 3); led field tour at experimental CAES plots in North Madison for Dr. Marlyse Duguid's Forest Stand Dynamics class at the Yale School of the Environment (20 attendees) (November 7); presented invited talk titled "Forest Health in Connecticut: Emerging problems and future research directions" to the MassConn Sustainable Forest Partnership at the Norcross Wildlife Foundation in Wales, MA (20 attendees) (November 14); participated in the Forest Ecosystem Monitoring Cooperative Joint State Coordinator-Steering Committee Meeting in Burlington, VT (25 participants) (November 19); presented Connecticut Forest Health updates at the annual Forest Ecosystem Monitoring Cooperative conference in Burlington, VT (220 attendees) (November 20).

MADELINE WATTS participated in a virtual meeting with the U.S. Army Corps of Engineers to discuss the CT River Hydrilla Project (November 12); met with Connecticut State Representative Renée LaMark Muir alongside OAIS staff to discuss aquatic plant research and management efforts in Connecticut (November 17); attended the CAES DEI Committee meeting (November 17).

SUMMER WEIDMAN received honorable mention (second place) for the poster "Detecting Northern Hydrilla (*Hydrilla verticillata* subsp. *lithuanica)* in the Connecticut River using Satellite Imagery" at the North American Lake Management Society Annual Conference in Myrtle Beach, SC (November 4-6); participated in CAES Accessibility meetings (November 10, 20); participated in virtual CT River Hydrilla project meetings with the US Army Corps of Engineers (November 12, 24); participated in the CAES DEI Committee meeting (November 17); with **GREG BUGBEE, JEREMIAH FOLEY, PH.D., RILEY DOHERTY,** and **MADELINE WATTS,** met with State Representative Renee LaMark Muir at CAES to discuss Connecticut River hydrilla and other aquatic invasive issues facing the state (November

17); participated in the virtual meeting of the Northeast Aquatic Plant Management Society's Scholarship Committee (November 20); led tour groups around CAES for the New Haven Public Schools Off Campus Classroom program (November 21).

LEIGH J. WHITTINGHILL, PH.D. attended a meeting with **VICKIE BOMBA-LEWANDOSKI**, **GALE RIDGE, PH.D.**, **KATHERINE DUGAS**, **NATLIE RIVERA** to discuss the next steps for meeting accessibility requirements for the CAES web pages (November 12); met with **KELSEY FISHER, PH.D.** and **CALEB BRYAN, PH.D.** to discuss a potential research collaborations (November 17); attended the CAES DEI committee meeting (November 17); attended a meeting with **VICKIE BOMBA-LEWANDOSKI**, **GALE RIDGE, PH.D.**, **KATHERINE DUGAS**, and **SUMMER WEIDMAN** to finalize the next steps for meeting accessibility requirements for the CAES web pages (November 20).

YINGXUE (CHARLIE) YU, PH.D. attended the CANVAS 2025 annual meeting in Salt Lake City, UT, chaired the Soil Physics and Hydrology Oral 1 Session at the (50 attendees), and served as student competition judge for the Soil Physics and Hydrology Division (November 9–12).

AWARDS:

LEIGH J. WHITTINGHILL, PH.D. was awarded one of the 2025 CAES Board of Control Research Awards for "Establishing green roof research platforms at CAES to investigate aspects of the use of this technology in urban agriculture." This project will establish 4x4 ft research platforms to enable work on using green roof technology to grow vegetables on urban rooftops. This research will focus on the use of compost as an amendment in this system and examine several, increasing compost additions. The platforms will be used to grow eggplants in 2026 and will be monitored for changes in substrate properties and nutrient leaching over time. $37,289.

ESF DEPARTMENT WELCOMES NEW STAFF MEMBERS:

JACK HATAJIK was recently hired as an Agricultural Research Technician I in the Department of Environmental Science and Forestry (ESF). He will be working in the Office of Forest Health with **ELISABETH WARD, PH.D.** and **J.P. BARSKY**, conducting research on emerging threats to forest ecosystems. This past summer, he was a Seasonal Technician in ESF studying the effects of Beech Leaf Disease on tree growth and mortality, as well as silvicultural harvest on tree regeneration. In May, he graduated from The Forest School at the Yale School of the Environment, where he received a Master of Forest Science degree. At Yale, he collaborated with **ELISABETH WARD, PH.D.**, **CLAIRE RUTLEDGE, PH.D.**, and researchers from The Forest School on a long-term project evaluating the impacts of emerald ash borer infestation on forest plant communities and soil nutrient cycling across Connecticut. Prior to his graduate studies, Jack received a Bachelor of Science in Ecology and Evolution as well as Film and Media Studies from the University of Pittsburgh in Pittsburgh, PA, where he calls home. In his free time, Jack loves to watch movies, discover new music, and explore the woods.

ANNA WIX recently graduated from Worcester Polytechnic Institute with a B.S. in Biology and Biotechnology and a B.A. in Environmental and Sustainability Studies. She started at CAES in May in the Mosquito Trapping and Arbovirus Surveillance Program and is now working as a seasonal assistant under **SUSANNA KERIÖ, DS.C.** and **ELISABETH WARD, PH.D.** on a project examining beech leaf disease and non-structural carbohydrates. She is interested in forestry and forest ecology and is in the process of applying to Master's Programs for Fall 2026.

Portland ESA: (left to right) **DR. JESSICA BROWN** (ESF), **DR. MEGAN LINSKE** (ENT), **NATALIE BAILEY** (ESF), and **DR. SCOTT WILLIAMS** (ESF) attended and presented research at the Entomological Society of America Conference in Portland, OR (November 8-13).

PLANT PATHOLOGY AND ECOLOGY

WASHINGTON DA SILVA, PH.D. gave a presentation, entitled "Small Things Considered: Leveraging RNAi and Nanotechnology for Plant Protection, at the Universidade Estadual de Maringa (UEM) in the state of Parana in Brazil (November 7, 83 adults), visited local grape growers, and had meetings with UEM faculty members to officialize an internship program where UEM graduate students will have the opportunity to come to CAES for six or 12 months to do internships at CAES (two students, Paula Rodrigues and Monique Rodrigues, already did internships a CAES and another student, Giovanna Seron, will come in March 2026 for a six-month internship at the da Silva Lab at CAES). **Dr. DA SILVA** also participated in two Ph.D. defenses as co-advisor: Breno de Holanda from the Universidade Federal Rural do Semi-árido (UFERSA) defended his Ph.D. thesis, entitled "Plasticity in *Trichoderma*: physiological limits and adaptive potential in variable environments and Sustainable Management of *Fusarium* Rots in Melons: A Dual Strategy Combining Thermotherapy and 1-MCP", on October 16th, and Daniel Cerrito from UCONN defended his thesis, entitled "Improving Management Recommendations for Alternaria Leaf Blight and Head Rot of Broccoli Using Fungicide Resistance Monitoring and Population Genetics", on November 3rd.

YONGHAO LI, PH.D. presented "Selection and Care of Houseplants" to the residents at the Elim Park in Cheshire (November 3, 35 adults); discussed plant disease diagnosis and pathogen monitoring via Zoom call with PhD Researcher Sreerag Kaaliveetil and Dr. Sagnik Basuray at the New Jersey Institute of Technology (November 4).

ROBERT MARRA, PH.D. gave a presentation on beech leaf disease at the winter meeting of the CT Chapter of the Appalachian Mountain Club (AMC), held at the Deer Lake Outdoor Center in Killingworth, CT. (November 8) (150 adults).

FELICIA MILLETT participated in the NPDN Proficiency Committee monthly meeting (November 20) (11 adults) and led a tour of the Plant Disease Information Office for the New Haven Public Schools' Off Campus Classroom program (Nov 21) (18 students, 6 adults).

QUAN ZENG, PH.D. gave a presentation on apples at the Peck Place School of Orange (November 12, 50 children and 3 adults).

PUBLICATIONS:

1. Li, D.-W., Paine, E., Schultes, N.P. (2025) A *Scytalidium*-like indoor fungus revealing polyphyletic relationships and convergent evolution in *Scytalidium*. Fungal Biology https://doi.org/10.1016/j.funbio.2025.101691

Abstract: A *Scytalidium*-like fungus was isolated from a dust sample collected indoors in the USA. Partial DNA sequences for the genomic regions of the 5.8S nuclear ribosomal DNA and flanking internal transcribed spacer (ITS), the nuclear ribosomal large subunit (LSU), the translation elongation factor 1-a (*tef1*), the b-tubulin (*tub2*) and the DNA-directed RNA polymerase II second largest subunit (*rpb2*) genes were determined. Phylogenetic analyses indicated that the indoor *Scytalidium*-like fungus is closely related to *Scytalidium flavobrunneum,* yet neither fungus is phylogenetically related to the generic type species, *Scytalidium lignicola*. Further analyses revealed that members of *Scytalidium* are polyphyletic belonging to eight orders: *Amphisphaeriales*, *Coryneliales*, *Helotiales*, *Hypocreales*, *Mycosphaerellales*, *Pleosporales*, *Sordariales*, *Xylariales*; seven subclasses: *Coryneliomycetidae*, *Dothideomycetidae*, *Hypocreomycetidae*, *Leotiomycetidae*, *Pleosporomycetidae*, *Sordariomycetidae*, *Xylariomycetidae* and four classes: *Eurotiomycetes*, *Dothideomycetes*, *Leotiomycetes*, and *Sordariomycetes*. *Scytalidium* s.s. belongs to *Helotiales*. The indoor fungus has dimorphic anamorphs and belongs to *Monochaetia*, *Amphisphaeriales* using sequences of five loci (ITS, LSU, *tub2*, *tef1* and *rpb2*). Species of *Scytalidium* belonging to other orders are combined in their respective genera based on phylogenetic analyses using ITS and LSU. In our opinion, the polyphyletic nature of *Scytalidium*-like fungi shared morphological characteristics is the result of convergent evolution. At the same time, three new species, *Scytalidium ruthenicum* D.W. Li & N.P. Schultes, *Monochaetia domiciliana* D.W. Li & N.P. Schultes and *Monochaetia arboricola* D.W. Li & N.P. Schultes, were described and illustrated.

New Grants Awarded:

Washington da Silva, Ph.D., received a research grant from the **Coordenação de Aperfeiçoamento de Pessoal de Nível Superior** (CAPES), the Brazilian federal agency for support and evaluation of graduate education, to host a student from Brazil, Giovanna Seron, in his lab at CAES for six months of training in molecular biology.

Dr. da Silva delivering a seminar at the Universidade Estadual de Maringa (UEM).

Dr. da Silva visiting grape growers from the state of Parana in Brazil.

VALLEY LABORATORY

DE-WEI LI, PH.D. made a presentation "Airborne fungal spore collection and identification" at the 3rd JASWNE, YWIB, & SCSU iHUB STEM Symposium @ Southern CT State University on Nov 21, 2025 (150 attendees) and his other research areas were discussed also.

JATINDER S AULAKH, PH.D. published a research paper entitled "Glyphosate- and Atrazine-Resistant Palmer amaranth in New York: Confirmation and Management with Alternative POST Herbicides (November 24, 2025); and submitted a co-authored manuscript entitled "Glyphosate Resistance in Italian ryegrass (Lolium perenne ssp. multiflorum) from New York State Associated with EPSPS Gene Amplification" (November 21, 2005); and "attended the final exam (via zoom) for Mr. Henrique dos Santos's Master graduation at Cornell University (November 13, 2025); and reviewed a manuscript entitled "Low Temperature Tolerance of Japanese Stiltgrass (Microstegium vimineum) and Southern Crabgrass (Digitaria ciliaris)" for the Journal of Environmental Horticulture (November 3, 2025).

RICHARD COWLES, PH.D.participated with a University of Maine virtual meeting to discuss "Progress in understanding Phytophthora in Christmas trees," Nov. 10 (6 participants). He discussed "Neonics and turf, adjusting to the new reality," at the CT Environmental Council annual meeting, Millbrook, Nov. 18 (150 attendees). He provided advice via Teams to the New Hampshire Pesticide Review Board on "Neonicotinoid benefits and environmental risks" Nov. 20 (10 attendees).

ROSE HISKES participated in a Connecticut Invasive Plant Working Group (CIPWG) symposium planning committee meeting via Zoom (November 20)

PUBLICATIONS:

1. Li, H., Bai, Y. Q., Xie, J. Y., **Li, D. W.** and Zhu, L. H. (2025) Two new species of *Pestalotiopsis* causing needle blight of *Pinus massoniana* in China. *MycoKeys* 125: 95-114. https://doi.org/10.3897/mycokeys.125.168320

Abstract: *Pinus massoniana* Lamb. is an important tree species widely used for afforestation and industrial timber on barren hills in China. Needle blight of *P. massoniana*, caused by *Pestalotiopsis* spp., is widespread and occurs over a large area. In this study, 10 representative strains were isolated from diseased needles of *P. massoniana* in Anhui and Guangxi provinces. Based on phylogenetic analysis of three genomic loci (ITS, *TEF1*, and *TUB2*), combined with morphological characteristics, two new species—*Pestalotiopsis liuzhouensis* sp. nov. and *Pestalotiopsis kendrickii* sp. nov.—were identified. Pathogenicity experiments showed that these 10 representative strains were pathogenic to *P. massoniana*. This study enhances understanding of the diversity of pathogens causing *P. massoniana* needle blight and provides insights for future control strategies.

2. Zhao, J. M., Peng, C. X., Zhang, Q. Y., **Li, D. W**, Lin, H. (2025) Five novel species of *Curvularia* isolated from turfgrass. *MycoKeys* 125: 279–305. https://doi.org/10.3897/mycokeys.125.168614

Abstract: *Curvularia*, a cosmopolitan fungal genus, occupies various ecological niches, but displays a pronounced tendency to colonise the leaves of plants. In this study, several fungal isolates with similar characteristics in the genus *Curvularia* were collected from leaf spots of turfgrasses (*Cynodon dactylon* and *Lolium perenne*) in Jiangsu Province, China. Based on the morphological characteristics and three locus phylogeny of the internal transcribed spacer (ITS) genes, glyceraldehyde-3-phosphate dehydrogenase (GAPDH) and translation elongation factor-1 alpha (*tef1*), five new species in *Curvularia*: *C. cynodontis*, *C. herbicola*, *C. loliicola*, *C. nanjingensis* and *C. xuanwuensis*, are described hereby. The present study contributes to the understanding of species diversity, taxonomy and phylogeny of *Curvularia* species in China.

3. He, J., Li, N, Huang, J. H., Ren, J. L., Guo, Y., Zhang, Q. Y., **Li, D. W**, Huang, H. (2025). *Alternaria yangkouensis* sp. nov., a novel causal agent of shoot blight on Chinese fir in Fujian, China). *Tree Health* 2 (4): 30-41.

Abstract: Chinese fir (*Cunninghamia lanceolata*) is an important fast-growing timber species widely cultivated in China, possessing significant ecological and economic value. Shoot blight is a fungal disease that affects the young shoots of seedlings, causing shoot dieback and severely hindering the growth of Chinese fir saplings. During surveys conducted at Nanping City, Fujian Province, China, typical shoot blight samples were collected, and potential pathogenic strains were obtained through tissue isolation and single-spore purification. Identification was performed using Koch's postulates, morphological characterization, and multi-gene phylogenetic analyses. The study confirmed that four newly obtained pathogenic strains belong to a novel species of *Alternaria*, named *Alternaria nanpingensis*. The novel species produces longer conidial chains, typically composed of 7~15 conidia, which are significantly more numerous than those of its related species: *A. dongshanqiaoensis* (5~9 conidia), *A. cinerariae* (2~9 conidia), *A. citri* (3~6 conidia), and *A. xinyangensis* (2~7 conidia). These findings expand the known diversity of pathogens causing shoot blight in Chinese fir and provide a theoretical foundation for future taxonomic research and disease control.

4. Rieley, M., Kumar, V., **Aulakh, J**., Stanyard, M., Jangra, S., Singh, J., Price, A. (2025). Glyphosate- and Atrazine-Resistant Palmer amaranth in New York: Confirmation and Management with Alternative POST Herbicides. *Weed Technology*. Available online at: https://www.cambridge.org/core/journals/weed-technology/article/glyphosate-and-atrazineresistant-palmer-amaranth-in-new-york-confirmation-and-management-with-alternative-post-herbicides/1435B10D8036BECBB97C55C18AA8DE80

CAES
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STATION NEWS

Abstract: Palmer amaranth is an increasing concern for producers in the northeastern United States. A new Palmer amaranth population (NY_PA) was identified from a soybean field in Ontario County, NY in 2024. The main objectives of this research were to (1) confirm whether this NY_PA population was resistant to glyphosate and atrazine (multiple herbicide-resistant, MHR), and (2) determine the effectiveness of various postemergence (POST) herbicides alone or in mixtures for its control. Along with the NY_PA population, two previously known glyphosate-resistant Palmer amaranth populations from Connecticut (CT_PA) and Kansas (KS_PA), and a known glyphosate-susceptible population from Alabama (AL_SUS) were also evaluated. Results from the quantitative polymerase chain reaction (qPCR) assay revealed that the NY_PA population had 165 to 199 copies of the 5-Enolpyruvylshikimate-3-phosphate synthase (EPSPS) gene as compared to a single EPSPS gene copy in the AL_SUS population. A greenhouse dose-response study revealed that the NY_PA and CT_PA Palmer amaranth populations had 7- to 11-fold resistance to atrazine. Nearly all POST herbicides tested, including 2,4-D, dicamba, saflufenacil, glufosinate, lactofen alone or in mixtures with 2,4-D, dicamba, and glufosinate, provided effective control (90 to 100%) of Palmer amaranth from NY, CT, and KS. All these POST herbicides, alone or in mixtures, reduced shoot dry biomass of all three populations by 82 to 97% as compared to the nontreated control. These results confirm the first report of MHR (resistant to glyphosate and atrazine) Palmer amaranth populations from NY and CT. Effective POST herbicides tested in this research can be used to manage these MHR Palmer amaranth populations.

JOURNAL ARTICLES APPROVED NOVEMBER 2025

Adeel, M., Nadeem, M., Zaheer, U., Shakoor, N., **White, J. C.**, Rui, Y. Earthworms enhance soybean yield and quality under n-La_2O_3 nanofertilizer treatment by restructuring the rhizosphere microenvironment. *ACS Nano*.

Bryan, C. B., Symak, B., Prager, S. Effects of Drought on Agricultural Bumblebee Communities in the Canadian Prairie Pothole Region. *Journal of Environmental Entomology*.

Fisher, K. E., **Bryan, C. B.**, Acevedo, C., Anderson, K. E., Goldman, K. M., Kulakowski, K., Shimota, S. N., Bradbury, S. P. Impacts of common milkweed (Asclepias syriaca) leaf age on larval monarch (Danaus plexippus) survival, growth, development, and feeding behavior. *Insects*.

Karisa, J., **Mohapatra, A. R.**, Abadam, C., Akaratovic, K., Kiser, J., and **Molaei, G.*** The Invasive Mosquito Aedes Albopictus—A Vector Of *Dirofilaria Immitis* in Suffolk, Virginia, United States. *Journal of Parasitology*.

Lv, Z., Cai, Z., Ma, C., **White, J. C.**, Xing, B. Nano-enabled agrochemicals for sustainable agriculture: Bridging gaps for food security in the 21st century. *Science*.

Munawar, A., Abou El-Ela, A., Zhang, X., Qingcheng, L., Mao, Z., Shamsi, I. H., Shi, X.-X., **White, J. C.**, Zhou, W., Zhu, Z. Nanoscale silica primes rice resistance to insect pests through coordinated activation of physical, chemical and volatiles-mediated defense responses. *ACS Nano*.

Sarabandi, M., Zargard, M., Ghorbani, A., **White, J. C.**, Chen, M. Harnessing multi-omics to engineer in planta toxic element tolerance. *Nano Today*.

Sun, D., Yan, Y., Du, P., Chen, Y., Wei, J., Deng, S., Kong. D., **White, J. C.**, Li, C. Iron-containing layered minerals suppress photochemical attenuation of imidacloprid by modulating reactive oxygen species content. *Journal of Hazardous Materials*.

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