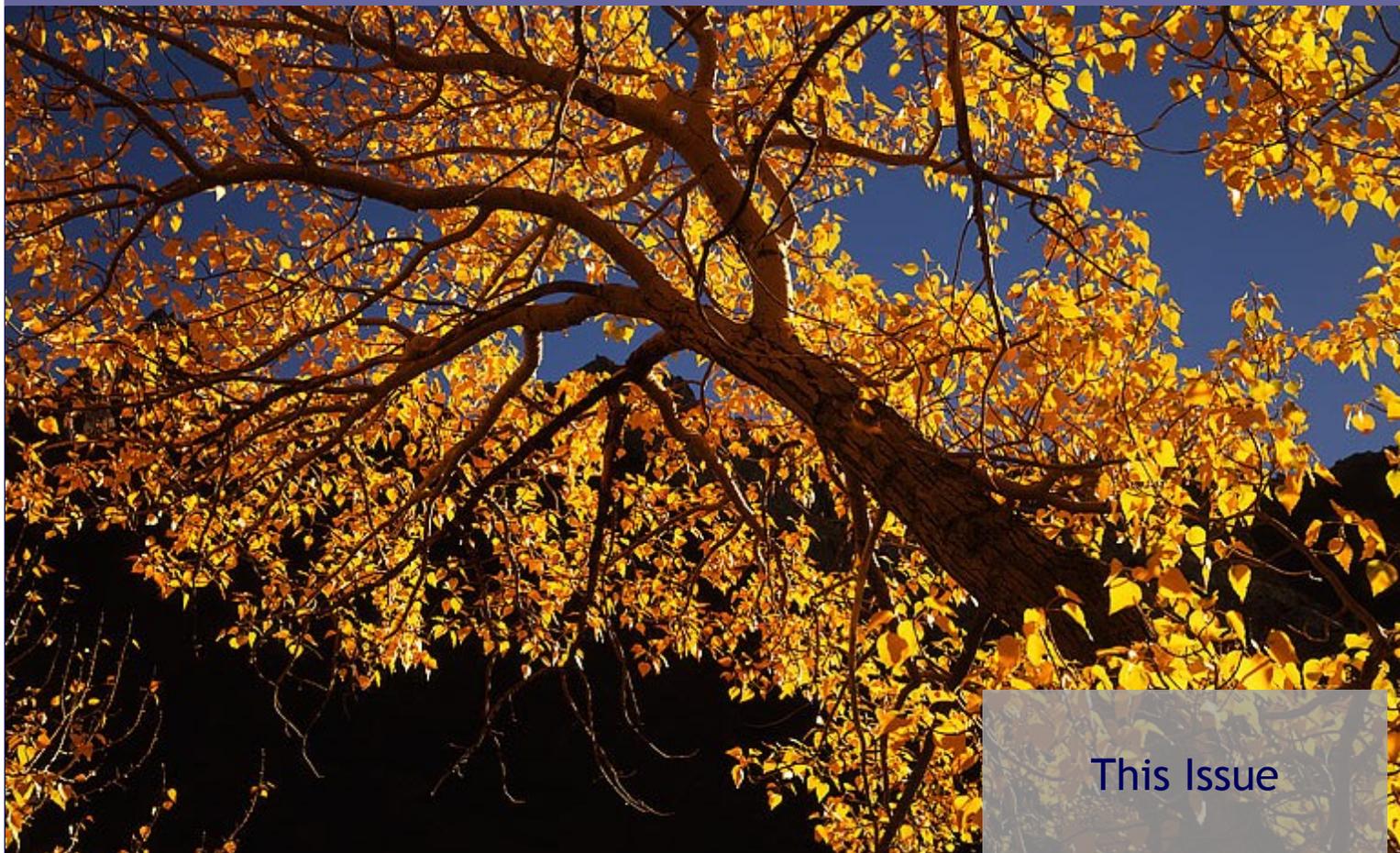


Station News

The Connecticut Agricultural Experiment Station
Volume 8 Issue 10 October 2018



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	2
Analytical Chemistry	2
Entomology	4
Environmental Sciences	5
Forestry and Horticulture	6
Plant Pathology and Ecology	7
Valley Laboratory	8
Dept. Research Updates	9
Journal Articles Approved	10
Articles of Interest	10
Grants	11

ADMINISTRATION

DR. THEODORE ANDREADIS was interviewed about ticks and the prevalence of tick-borne diseases in Connecticut this season by Amanda Cuda, Connecticut Post (September 10); participated in an Invasive Plant Council meeting held at the Valley Laboratory in Windsor (September 11); attended a reception at the annual meeting of the National Association of State Departments of Agriculture (NASDA) held at The Society Room of Hartford (September 12); hosted Ms. Beverly Samuel, National Program Leader for the USDA National Institute of Agriculture (NIFA), and provided an overview of the Station's research, diagnostic, and regulatory programs (September 19); participated in an Executive Board meeting of the Experiment Station Associates held at the Station (September 19); and presented a seminar entitled "*Reflections on the ecology and epidemiology of mosquito-borne viruses in Connecticut: an analysis from twenty years of research and surveillance*" held at the Station (September 26).

ANALYTICAL CHEMISTRY

DR. JASON C. WHITE participated in a conference call with Professor Greg Lowry and others on a collaborative NSF grant submission (September 4); attended the 2018 International Conference on the Environmental Effects of Nanoparticles and Nanomaterials (ICEENN) at Duke University and gave a platform presentation entitled "Engineered nanomaterials suppress fungal and viral crop disease" (100 attendees) (September 5-7); participated in weekly All-Hands ZOOM calls for the Center for Sustainable Nanotechnology (September 5, 12, 26); spoke by phone with Mr. Jack Crane of CONNSTEP Inc. about food production and food safety in CT (September 11); participated in a Skype call with Professor Melanie Kah of the University of Vienna and Professor Nathalie Tufenjki of McGill University regarding a joint publication in *Nature Nanotechnology* (September 12); along with **MR. CRAIG MUSANTE, DR. BRIAN EITZER, MS. TERRI ARSENAULT, DR. WALTER KROL,** and **MR. JOHN RANCIATO,** participated in the monthly FDA cCAP WebEx (September 13); gave a presentation entitled "Use of engineered nanomaterials to suppress plant disease" at the Sussex Plant Biology Symposium held in Jones Auditorium and sponsored by Yale University (40 attendees) (September 14); hosted Ms. Becky Curtis, a Ph.D. student from the University of Wisconsin Milwaukee, for the week (I am on her Ph.D. committee) (September 17-22); along with **DR. BRIAN EITZER, DR. WALTER KROL, DR. CHRISTINA ROBB, DR. NUBIA ZUVERZA-MENA,** and **DR. ROBERTO DE LA TORRE ROCHE,** met with Dr. Beverly Samuel of USDA NIFA regarding Department Programs (September 19); along with **DR. WADE ELMER,** hosted the semi-annual All-Hands meeting of the Center for Sustainable Nanotechnology and gave a presentation entitled "Nano-enabled Agriculture: What are the important chemistry-driven, mechanistic questions relevant to nanoparticle interactions/uptake/transport in plants?" (70 attendees) (September 21-22); and met with Ms. Sylvia Homans of SCSU regarding Department programs and research (September 28).

DR. CHRISTINA ROBB participated in the Eastern Analytical Symposium (EAS) board meeting (September 14).

DR. BRIAN EITZER was a participant in the monthly conference call of the North American Chemical Residue Workshop's Organizing Committee (September 13).

DR. WALTER KROL served as a Judge for the 2018 Big E Future Farmers of America Agriscience Fair (September 14).

DR. NUBIA ZUVERZA-MENA, with **MR. MARK CREIGHTON**, staffed the CAES booth at The Big E fair in West Springfield, MA (September 18); and participated as a tour guide for attendees of the Center for Sustainable Nanotechnology (CSN) annual meeting (September 21).



Faculty and graduate students/post-docs of the NSF-funded Center for Sustainable Nanotechnology; the Center's annual meeting was hosted by CAES.



J.C. White presented at the 2018 ICEENN meeting at Duke University.

ENTOMOLOGY

DR. KIRBY C. STAFFORD III was interviewed by Kaitlyn McGrath, NBC Connecticut, about the prevalence (spread) of invasive species of insects and the impact on Connecticut's tree population (September 5); presented two posters, one on lone star ticks in Connecticut and the other on overwintering survival of ticks in CT and Maine at the International Conference for Lyme Borreliosis and Other Tick-Borne Diseases held at the Centers for Disease Control and Prevention in Atlanta, GA (September 11-14); participated in a visit by Dr. Beverly Samuel, National Program Leader at USDA-NIFA (September 19); and participated in a visit by Drs. Jian Sun and Jocelyn Mullins from the CT Department of Public Health (September 25).

MR. MARK H. CREIGHTON visited the Beth El Keser Synagogue in New Haven and spoke about honey bee health issues (30 attendees) (September 2); visited The Sound School in New Haven and demonstrated honey bee hive inspections (20 students and staff) (September 13); staffed a CAES booth at The Big E in West Springfield, MA, speaking to several hundred visitors on the mission of CAES and on honey bee health topics (September 18); and set up a bee health booth and discussed bee-related topics at the Franklin Wildlife Center in Franklin (48 visitors) (September 22).

MS. KATHERINE DUGAS set up and staffed a CAES display table at the Woodstock Fair (146 attendees) (September 1-3).

DR. MEGAN LINSKE gave a poster presentation entitled "*Ixodes scapularis* reservoir host diversity and abundance impacts on dilution of *Borrelia burgdorferi* in residential and woodland habitats in Connecticut, United States" at the 15th Annual International Conference on Lyme borreliosis and other Tick-borne Diseases at the Centers for Disease Control and Prevention in Atlanta, Georgia (300 attendees) (September 13); demonstrated small rodent trapping and handling techniques to undergraduate students in the Wildlife Sampling Techniques class at the University of Connecticut, Storrs (September 17); participated in the Northeast Regional Center for Excellence in Vector-borne Diseases trainee seminar (September 18); participated in a conference call with US Biologic on current research updates and future funding opportunities (September 19); conducted a Wildlife Society Leadership Institute conference call (September 26); and participated in a conference call with US Biologic on collaborative research and funding opportunities for *Ixodes scapularis* habitat suitability modeling research (September 28).

DR. GALE E. RIDGE spoke about bed bugs to the Woodbridge Garden Club in Woodbridge (30 attendees) (September 18); presented a talk about bed bugs to the Connecticut Association for Public Health Nurses in Madison (48 attendees) (September 20); and hosted two groups of visiting scientists who were attending a Center for Sustainable Nanotechnology meeting at CAES showing her research and functions of the Insect Information Office (September 21).

DR. VICTORIA L. SMITH, with **MS. TIA BLEVINS**, met with USDA-APHIS-Export Services personnel and representatives from three European Union Plant Protection Organizations for an audit of operations at CT Daylily, in Wallingford, which is considered by the EU as a Pest Free Place of Production (September 19). Standard operating procedures,

testing records, pest surveys, inspection reports, and export records were examined in detail.

DR. KIMBERLY A. STONER presented a talk entitled “Planting for the Bees’ Needs” at the Mitchell Branch of the New Haven Public Library (19 attendees) (September 4) and presented a talk entitled “Planting for the Bees’ Needs” to the New Roxbury Land Trust at Roseland Park in Woodstock (22 attendees) (September 23).

ENVIRONMENTAL SCIENCES

DR. JOSEPH PIGNATELLO participated in an oral presentation of the grant application “Innovative Treatment Options to Mitigate Munitions Constituent Transport on DoD Testing and Training Ranges,” with W. Xu and others before the Technical Scientific Review Panel at DoD Strategic Research and Development Program (SERDP) offices in Arlington, VA (September 12-13).

DR. DOUG BRACKNEY gave an invited seminar entitled “Navigating anatomical barriers to transmission: an arbovirus tale” at the National Emerging Infectious Diseases Laboratory within the Boston University School of Medicine (approx. 60 attendees) (September 26).

MS. ANGELA BRANSFIELD attended the Electronic Federal Select Agent Program Information System Regional Workshop held in Farmington (September 18).

MR. GREGORY BUGBEE gave a talk entitled “Container Gardening Indoors and Out” to the Morris Cove Garden Club at the East Haven Firehouse (approx. 30 attendees) (September 12); and judged the Future Farmers of America Science Fair at The Big E in West Springfield, MA (September 14).

DR. GOUDARZ MOLAEI was interviewed by NBC Connecticut, <https://www.nbcconnecticut.com/news/local/Tick-Outlook-for-Connecticut-So-Far-This-Year-492896861.html> (September 10); was interviewed by the Connecticut Post, <https://www.ctpost.com/local/article/Do-lots-of-ticks-mean-lots-of-Lyme-Maybe-not-13219038.php> (September 10); met with Asst. Prof. Caitlin Hanlon, Biological Sciences Department, Quinnipiac University, to discuss collaborations (September 17); hosted Dr. Thomas Durant, to discuss collaborative research projects on ticks and mosquitoes and services offered by the Tick Testing Program (September 18); conducted a workshop on tick identification and testing for Prof. David Della-Giustina of Yale-New Haven Hospital and a group of Residents and others from the Yale School of Medicine and Yale-New Haven Hospital and (7 attendees) (September 19); hosted two groups of faculty and graduate students attending the Center for Sustainable Nanotechnology symposium on tours of the Tick Testing Laboratory (15 attendees) (September 21); met with Prof. Alicia Bray and graduate student Shannon Garrick from the Biology Department of Central Connecticut State University to discuss co-advising the student and a thesis project on ticks and tick-borne diseases (September 24); and met with Dr. Sun and Dr. Mullins, officials from the Connecticut State Department of Public Health, and discussed passive tick surveillance at the CAES Tick Testing Laboratory (September 25).

MR. JOHN SHEPARD spoke about the state Mosquito Trapping and Testing Program to attendees of the Center of Sustainable Nanotechnology meeting (approx. 40 attendees) (September 21).

DR. CHARLES R. VOSSBRINCK presented informal talks on propagation and growth of figs at the Food and Fig Festival in West Haven (Mayor Nancy Rossi and approx. 100 other attendees) (September 29).

FORESTRY AND HORTICULTURE

DR. JEFFREY S. WARD administered practical and oral examinations to arborist candidates for the Connecticut Tree Protection Examining Board (September 5) and was interviewed about fall colors by Alyssa Taglia of WTNH News Channel 8 (September 17).

DR. MARTIN P.N. GENT gave a talk entitled "Modeling translocation and metabolism in plants" at the International Horticultural Congress held in Istanbul, Turkey (September 14).

DR. ABIGAIL A. MAYNARD judged the fruit and vegetables at the North Haven Fair (September 6); inspected a composting operation at Wesleyan's Long Lots Farm in Middletown (6 students) (September 7, 10); discussed the New Crops Program with Yale students at the Yale farm (4 students) (September 14); and discussed the New Crops Program with 5 growers at the New Haven farmers' market in Fair Haven (September 20).

DR. SCOTT C. WILLIAMS was appointed to the Editorial Advisory Board of The Wildlife Society's "The Wildlife Professional" as the Northeast Section representative (September 7); attended the 15th International Conference on Lyme Borreliosis and Other Tick-Borne Diseases and presented an invited lecture entitled "Less toxic integrated control of juvenile *Ixodes scapularis* in residential southwestern Connecticut" at the Centers for Disease Control and Prevention's Atlanta, GA campus (September 11-14); with **MR. MICHAEL R. SHORT**, conducted a small mammal trapping demonstration to students in the Wildlife Management Techniques class in the Department of Natural Resources and the Environment at the University of Connecticut (18 students, 1 professor) (September 17); and participated in a conference call on collaborative research updates with US Biologic (September 19).

MR. JOSEPH P. BARSKY served as a judge at the 2018 Big-E Agriscience Fair in Springfield, MA (9 students) (September 14); and participated in the New England Society of American Foresters Executive Committee Meeting held in Concord, NH (September 19).

PLANT PATHOLOGY AND ECOLOGY

DR. ZHOUQI CUI gave an oral presentation entitled “*Dickeya dadantii* forms elongated cells during the infection of potato tubers: causal conditions, molecular basis, and implications to pathogenicity” to the Sussex Plant Biology Symposium held in Jones Auditorium (70 attendees) (September 14).

DR. WADE ELMER presented a poster entitled “Using Nanoparticiles of metalloids and metal oxides in plant disease suppression” at the Sussex Plant Biology Symposium (organized by Yale University) in Jones Auditorium (70 adults) (September 14); along with **DRS. ZHOUQI CUI, WASHIBTON da SILVA, YONGHAO LI, ROBERT MARRA, QUAN ZENG** and **TEJA SHIDORE**, met with Dr. Beverly Samuel from National Institute Food and Agriculture and discussed research programs in the Department of Plant Pathology; with **DR. JASON WHITE** co-sponsored an All-Hands meeting of the NSF Sustainable Nanotechnology Center in Jones (September 21-22); with **Dr. Jason White**, co-presented “Nano-enabled Agriculture: What are the important chemistry-driven, mechanistic questions relevant to nanoparticle interactions/uptake/transport in plants” at the All Hands meeting of the Center for Sustainable Nanotechnology held in Jones Auditorium (85 attendees) (September 21).

DR. YONGHAO LI presented “Pruning 101” to members of the Spring Glen Garden Club in Hamden (15 adults) (September 10); and presented “Common Disease Problems 2017-18” at the Nursery and Landscape Research Tour held at the Valley Laboratory in Windsor (10 adults) (September 13).

DR. ROBERT MARRA presented "Accurately accounting for decay and carbon loss in trees: a novel nondestructive approach using tomography" as part of Yale University's Sussex Plant Biology Symposium held in Jones Auditorium (70 adults) (September 14); along with Ms. Alysha Auslender, a SCSU Master's student with **Dr. Marra**, presented a poster entitled “Development of microsatellite markers for population genetic analyses of the saltmarsh pathogen, *Fusarium palustre*” at the Yale University Sussex Plant Biology Symposium held in Jones Auditorium (70 adults) (September 14).

DR. NEIL SCHULTES presented a poster entitled “Nucleobase transport in *Erwinia amylovora*” at the Sussex Plant Biology Symposium held in Jones auditorium (70 attendees) (September 14).

DR. TEJA SHIDORE gave an oral presentation entitled “Impact of Toxin-Antitoxin systems on persistence and fitness of fire blight pathogen *Erwinia amylovora*” at the Sussex Plant Biology Symposium held in Jones Auditorium (70 attendees) (September 14).

DR. QUAN ZENG gave an oral presentation entitled "Fire blight diagnosis and management" at the Nursery and Landscape Research Tour held at the Valley Laboratory in Windsor (20 adults) (September 13); gave an oral presentation entitled "Microbiome associated with apple flowers and its impact on fire blight infection" at the Sussex Plant Biology Symposium (organized by Yale University) held in Jones Auditorium (70 adults) (September 14); met with Dr. Beverly Samuel, the National Program Leader of USDA NI-

FA (September 19); and gave a tour and introduction about his research program for visitors from the Center for Sustainable Nanotechnology (40 adults) (September 21).



Dr. Quan Zeng leads the games at a baby shower for Dr. Lindsay Triplett, thrown by Dr. Zeng and Ms. Regan Huntley.

VALLEY LABORATORY

DR. JATINDER S AULAKH participated in the CIPWG meeting held at the Valley Laboratory in Windsor (September 20); and talked about weed management at the Christmas Tree Growers twilight meeting held at Hickory Ridge Tree Farm in Coventry (September 22).

DR. RICHARD COWLES presented the poster “Establishing bee forage to assist honey bee genetic improvement” at Plant Science Day, Hamden (August 8); participated in the School IPM Workshop hosted by UConn Cooperative Extension by presenting “Insect management in schoolground turf” in East Haddam (120 attendees) (August 14); conducted a pest diagnostic walking tour at Connecticut College for the National Plant Diagnostic Information Network (30 attendees) (August 16); presented “Neonicotinoid Research Update” at the Nursery and Landscape Research Tour held at the Valley Laboratory (8 attendees) (September 13); and discussed his honey bee research with the talk “The queen of your dreams” to the Back Yard Bee keepers Association in Weston (25 attendees) (September 26).

DR. JAMES LAMONDIS conducted oral exams for candidates for the Connecticut arborist license and participated in the quarterly meeting of the Connecticut Tree Protection Examining Board in New Haven (September 5); welcomed participants and spoke about boxwood blight and disease management at the Nursery and Landscape Research Tour held at the Valley Laboratory in Windsor (6 attendees) (September 13); and participated in a boxwood blight SCRI grant planning conference call (15 attendees) (September 21).

Borgatta, J.; Ma, C.; Hudson-Smith, N.; Elmer, W.; Plaza Pére, C.D.; De La Torre-Roche, R.; Zuverza-Mena, N.; Haynes, C.L.; White, J.C.; Hamers, R.J. 2018. Copper nanomaterials suppress root fungal disease in watermelon (*Citrullus lanatus*): Role of particle morphology, composition and dissolution behavior. *ACS Sustain. Chem. Eng.* DOI: 10.1021/acssuschemeng.8b03379.

Abstract- With increasing global population, innovations in agriculture will be essential for a sustainable food supply. We compare commercial CuO NP to synthesized $\text{Cu}_3(\text{PO}_4)_2 \cdot 3\text{H}_2\text{O}$ nanosheets to determine the influence of coordinating anion, particle morphology, and dissolution profile on *Fusarium oxysporum* f. sp. *niveum* induced disease in watermelon. Copper dissolution in organic acid solutions that mimic complexing agents found in plants was increased by two orders of magnitude relative to water. $\text{Cu}_3(\text{PO}_4)_2 \cdot 3\text{H}_2\text{O}$ nanosheets showed a rapid initial dissolution, with equilibration after 24 h; CuO NP exhibited continuous particle dissolution. In a greenhouse study, $\text{Cu}_3(\text{PO}_4)_2 \cdot 3\text{H}_2\text{O}$ nanosheets at 10 mg/L significantly repressed fungal disease as measured by yield and by a 58% decrease in disease progress. Conversely, CuO NP only yielded significant effects on disease at 1000 mg/L. In field studies, similar enhanced disease suppression was noted for $\text{Cu}_3(\text{PO}_4)_2 \cdot 3\text{H}_2\text{O}$ nanosheets, although biomass and yield effects were variable. The method of application was a significant factor in treatment success, with the dip method being more effective than foliar spray; this is likely due to homogeneity of coverage during treatment. The data show that Cu-based nanoscale materials can be an effective and sustainable strategy in the crop disease management but that particle characteristics such as morphology, coordination environment, and dissolution profile will be important determinants of success.

Jia, W.; Ma, C.; Yin, M.; Cao, H.; Wang, J.; Wang, C.; Sun, H.; White, J.C.; Xing, B. 2019. Effects of biochar on 2, 2', 4, 4', 5, 5'-hexabrominated diphenyl ether (BDE-153) fate in *Amaranthus mangostanus* L.: Accumulation, metabolite formation, and physiological response. *Sci. Tot. Environ.* 651:1154-1165.

Abstract- We investigated the accumulation and metabolism of 2, 2', 4, 4', 5, 5'-hexabrominated diphenyl ether (BDE-153) in *Amaranthus mangostanus* L. (amaranth) as affected by different concentrations of biochar (1.3 to 26.6 g/L) under hydroponic conditions. Biochar significantly reduced BDE-153 shoot and root content by 27.5-61.6% and 73-95.3%, respectively. Root and shoot Fe content was significantly correlated with the BDE-153 amounts at $R^2=0.948$ and 0.822 , respectively. Physiological parameters, including fresh biomass, total TOC content in the rhizosphere solution, photosynthetic parameters, and antioxidant defense endpoints, were measured across all the treatments. The high concentration of biochar reduced pigment content, increased total ROS, and elevated of antioxidant enzyme activity. Transmission electron microscopy (TEM) indicated that co-exposure to BDE-153 and biochar severely altered the chloroplasts in terms of the organelle shape and the presence of starch granules in the chloroplast. Taken together, biochar as a soil amendment could significantly affect BDE-153 uptake and metabolism in plants. Furthermore, our findings illustrate the important role of Fe in the debromination of BDE-153.

P Kotsakiozi, B R. Evans, A Gloria-Soria, B Kamgang, M Mayanja, J Lutwama, G Le Goff, D Ayala, C Paupy, A Badolo, J Pinto, C A. Sousa, A D. Troco, J R. Powell. Population structure of a vector of human diseases: *Aedes aegypti* in its ancestral range, Africa. *Ecol Evol.* (2018) 8: 7835-7848. <https://doi.org/10.1002/ece3.4278>.

Abstract- *Aedes aegypti*, the major vector of dengue, yellow fever, chikungu-

nya, and Zika viruses, remains of great medical and public health concern. There is little doubt that the ancestral home of the species is Africa. This mosquito invaded the New World 400-500 years ago and later, Asia. However, little is known about the genetic structure and history of *Ae. aegypti* across Africa, as well as the possible origin(s) of the New World invasion. Here, we use ~17,000 genome-wide single nucleotide polymorphisms (SNPs) to characterize a heretofore undocumented complex picture of this mosquito across its ancestral range in Africa. We find signatures of human-assisted migrations, connectivity across long distances in sylvan populations, and of local admixture between domestic and sylvan populations. Finally, through a phylogenetic analysis combined with the genetic structure analyses, we suggest West Africa and especially Angola as the source of the New World's invasion, a scenario that fits well with the historic record of 16th-century slave trade between Africa and Americas.

JOURNAL ARTICLES APPROVED SEPTEMBER 2018

Bohne, M., **Claire E. Rutledge**, T. Hanson, et al. Utilizing *Cerceris fumipennis* (Hymenoptera: Crabronidae) foraging for survey of Buprestidae (Insecta: Coleoptera) in New England. *The Coleopterists Bulletin*

Cheah, Carole. Hemlock woolly adelgid (HWA) *Adelges tsugae* Annand. *CAES Fact Sheet*

Gorham, C., A. Barry, B. Lawrence, and **Blaire Steven**. Biogeography and edaphic factors structure coastal sediment microbial communities more than vegetation removal by sudden vegetation dieback. *Applied and Environmental Microbiology*

Hiskes, Rose T. and **Richard S. Cowles**. Managing white grubs in home lawns. *CAES Fact Sheet*

Kruidhof, M. and **Wade H. Elmer**. Cultural methods for greenhouse pest and disease management. In: M. Lodovica Gullino, R. Albajes, P. Nicot, and J. van Lenteren (Eds.), *Integrated Pest and Disease Management in Greenhouse Crops, 2nd edition*

Schultes, Neil P., N. Strzalkowski, and **De-Wei Li**. *Botryotrichum domesticum* sp. nov., a new hyphomycete from an indoor environment. *Mycological Progress*

ARTICLES OF INTEREST SEPTEMBER 2018

Nursery and Landscape Research Tour

The Connecticut Agricultural Experiment Station Valley Laboratory hosted a meeting for nursery and landscape professionals on September 13, 2018. Speakers included Dr. Rich Cowles, who spoke about “Neonicotinoid insecticides research results”; Dr. Yonghao Li, “Common cultural/disease problems in 2017 -18”; Ms. Rose Hiskes, “Common insect problems in the landscape”, and Dr. Quan Zeng, who discussed “Fireblight: hosts, favorable conditions and management”. Field tours included Rose Hiskes, who spoke about “Rejuvenating a 20-year-old landscape”; Mr. Thomas Rathier, “Soils and the landscape”; Dr. James LaMondia, “The latest on boxwood blight and management”; and Dr. Jatinder Aulakh, “Crop safety trials for container ornamentals”. James Preste assisted with meeting preparation. The meeting qualified for pesticide recertification credits.

CAES



The Connecticut Agricultural Experiment Station

Putting Science to Work for Society since 1875

STATION NEWS

GRANTS RECEIVED SEPTEMBER 2018

DR. ROBERT E. MARRA was awarded \$30,800 by the U.S. Forest Service, under the Forest Health Protection program, for “Enhanced Oak Wilt Monitoring,” (September 12, 2018).



CAES

The Connecticut Agricultural Experiment Station

Putting Science to Work for Society since 1875

The Connecticut Agricultural Experiment Station

Main Laboratories
123 Huntington Street
New Haven, CT 06511-2016
Phone: 203-974-8500



Main Laboratories, New Haven



Lockwood Farm, Hamden

Lockwood Farm
890 Evergreen Avenue
Hamden, CT 06518-2361
Phone: 203-974-8618

Griswold Research Center
190 Sheldon Road
Griswold, CT 06351-3627



Griswold Research Center, Griswold



Valley Laboratory, Windsor

Valley Laboratory
153 Cook Hill Road
Windsor, CT 06095-0248
Phone: 860-683-4977

Putting Science to Work for Society.

The Connecticut Agricultural Experiment Station

Back and Current issues of Station News are located on our website at <http://www.ct.gov/caes/cwp/view.asp?a=2826&q=378188>

The Connecticut Agricultural Experiment Station (CAES) prohibits discrimination in all of its programs and activities on the basis of race, color, religious creed, age, sex, marital status, veteran status, sexual orientation, gender identity, gender expression, national origin, ancestry, criminal conviction record, genetic information, learning disability, present or past history of mental disability, intellectual or physical disability, including, but not limited to blindness, of an applicant for employment or an employee, unless the mental disability or physical disability prevents adequate performance. To file a complaint of discrimination, contact Dr. Jason White, Vice Director, The Connecticut Agricultural Experiment Station, P.O. Box 1106, New Haven, CT 06504, (203) 974-8523 (voice), or Jason.White@ct.gov (e-mail). CAES is an affirmative action/equal opportunity provider and employer. Persons with disabilities who require alternate means of communication of program information should contact the Chief of Services, Michael Last at (203) 974-8442 (voice), (203) 974-8502 (FAX), or Michael.Last@ct.gov (e-mail).

Station News was prepared and edited by Dr. Theodore G. Andreadis, Ms. Vickie Bomba-Lewandoski, Ms. Sandra Carney, and Ms. Brandi Marks.

Volume 8 Issue 10
October 2018

WWW.CT.GOV/
CAES