

# Station News

The Connecticut Agricultural Experiment Station  
Volume 6 Issue 10 October 2016



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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## ADMINISTRATION / BUSINESS OFFICE

**DR. THEODORE ANDREADIS** presented opening remarks and an overview of CAES current research programs and diagnostic services available to citizens to the Federated Garden Clubs of Connecticut Garden Studies School held in Jones Auditorium (September 13); participated in a meeting of Connecticut's Invasive Plant Council held in Hartford (September 13); hosted a group MPH students from the School of Public Health at Yale University who came to the Station to learn about possible research opportunities for their rotations and theses (September 20); presented a talk entitled "Morphological and molecular characterization of a novel microsporidian parasite from the invasive Asian rock pool mosquito, *Aedes japonicus*" at the 25<sup>th</sup> International Congress of Entomology held in Orlando, FL (September 25-30).

**MRS. VICKIE BOMBA-LEWANDOSKI** attended training sessions for FE3 Facilitating Environmental Education Excellence, Project Learning Tree Workshop, Connecticut Forest and Park Association, Rockfall (September 9) and elected to serve on the New Haven County Farm Bureau Association's Board as Secretary at the New Haven County Farm Bureau Association's Annual Meeting (September 20).

## ANALYTICAL CHEMISTRY

**DR. JASON C. WHITE** along with **MR. MICHAEL CAVADINI, MR. JOSEPH HAWTHORNE, DR. WALTER KROL, MR. CRAIG MUSANTE, MS. KITTIPATH P.-RIVEROS, DR. BRIAN EITZER, AND MS. TERRI ARSENAULT** participated in the monthly FDA FERN cCAP teleconference call (September 8); along with **MS. KITTIPATH P.-RIVEROS AND MS. TERRI ARSENAULT** participated in the FDA ISO Accreditation year 4 wrap-up teleconference call (September 12); along with **DR. LUCA PAGANO, MR. FRANCESCO PASQUALI, DR. MARTA MARMIROLI, AND DR. SANGHAMITRA MAJUMDAR** met with Ms. Sue Isch at the CT Department of Public Health Laboratory to discuss collaborative experiments involving the use of the DPH electron microscope system (September 14); along with **DR. BRIAN EITZER, DR. NUBIA ZUVERZA-MENA, AND MR. JOHN RANCIATO** participated in a conference call with Mr. Jason Kong of the Ohio Department of Agriculture to discuss animal feed analysis for mycotoxins (September 14); participated in the quarterly FDA FERN Northeast Region teleconference call (September 15); attended to 6<sup>th</sup> International Conference on Soil Pollution and Remediation (SOILREM) in Hangzhou China and gave a presentation entitled "The role of endophytes in the phytoremediation of persistent pesticides" (September 23-26); attended the 13<sup>th</sup> International Phytotechnology Conference in Hangzhou China and gave a lecture entitled "Accumulation and transfer of engineered nanoparticles in terrestrial food chains: Correlating physiological and molecular response" (September 26-28); chaired a technical session entitled "Plant and Nanoparticle Interactions" at the 13<sup>th</sup> International Phytotechnology Conference (September 27); and chaired an Editorial Board meeting of the International Journal of Phytoremediation in Hangzhou China (September 27).

**DR BRIAN EITZER** was a participant in the North American Chemical Residue Workshop's organizing committee phone conference (September 8) and the phone meeting of the Mass Spectrometry working group of the FERN cCAP chemistry contributors (September 28).

**DR CHRISTINA ROBB** attended a board meeting of the Eastern Analytical Symposium (EAS) in Princeton, NJ (September 16); a phone meeting of EAS board members on (September 28), and a phone meeting of the Mass Spectrometry working group of FERN cCAP Chemistry contributors (September 28).

## ENTOMOLOGY

**DR. KIRBY C. STAFFORD III** participated in a meeting of the Connecticut Coalition Against Bed Bugs (September 12); visited by Steve Young, Director Northeast IPM Regional Center (September 14); participated in a dissertation committee meeting at UConn (September 21); presented a talk titled “Integrated tick management of the blacklegged tick to reduce the risk of Lyme disease” and co-moderated this tick session while at the XXV International Congress of Entomology (ICE) in Orlando, FL held in conjunction with the Entomological Society of America (September 25-30). There were 6,682 registrants from 102 countries at this prestigious conference with 298 symposia, 5,396 oral and poster presentations, 8 keynote addresses and 2 Nobel Laureate presentations.

**MS. KATHERINE DUGAS** set up and staffed Forest Pest display booth at the Woodstock Fair (September 2-5); gave a talk to the Woodbridge Garden Club about pests and beneficial insects in the garden (September 13); gave a talk at Flanders Nature Center in Woodbury about insect pollinators and biological control (September 15); and attended the Vernon Greenways Beetlemania event with Rose Hiskes (September 17). Station staff and Vernon Greenways members identified and surveyed ALB/EAB host trees along the Rail Trail and distributed ALB/EAB identification cards to people using the trail. Staffed a joint Forest Pest/Honey Bee booth in the Connecticut Building at the Big E with **MR. MARK CREIGHTON** and **MS. ROSE HISKES** (September 22); assisted in staffing a CAES booth at the Durham Fair along with **MR. MARK CREIGHTON** and **MR. JOSEPH P. BARSKY** (September 23-25); and gave a talk about forest pests to the CT Chapter of the Hardy Plant Society in Wethersfield (September 28).

**MR. MARK H. CREIGHTON** met with Common Ground High School advisors at West Rock Nature Center to review site for a new Apiary for our Youth Beekeeping Grant (September 14); met with a Honors Student at Amity High School to develop a project/study related to Honey Bee health (September 16); set up a Honey Bee educational booth at The Big "E" in the Connecticut Building that was visited by several hundred attendees (September 22); attended the Durham Fair and manned the CAES booth and set-up a Honey Bee Education table that was visited by 538 visitors (September 24) and met with students from Common Ground High School at West Rock Nature Center for site development/apiary planning session with students in support of our Youth Beekeeping Grant (September 29).

**DR. CHRIS T. MAIER** presented a poster on “Longhorned Beetles (Coleoptera: Cerambycidae) of Connecticut, U.S.A.” while attending the XXV International Congress of Entomology in Orlando, FL (September 25-30).

**DR. GALE E. RIDGE** presented a talk on “The maligned human bed bug, a masterpiece in adaptation and survival” and was a co-author on a presentation by colleague Dr. Johnathan Sheele titled “Systemic effects of ivermectin and moxidectin on the common bed bug, *Cimex lectularis* L.” while attending the International Congress of Entomology in Orlando, FL (September 25-30).

**DR. CLAIRE E. RUTLEDGE** helped administer the oral portion of the Connecticut State Arborist License Exam. New Haven, CT (September 7) and her invited talk “Bronze Birch Borer, *Agilus anxius* (Coleoptera: Buprestidae) was presented in the session “Profiles of Forest Pests Ready to Cross Borders and Invade New Areas” at the XXV International Congress of Entomology in Orlando, FL (September 25).

**DR. VICTORIA L. SMITH** with **MR. MICHAEL LAST**, **DR. THEODORE G. ANDREADIS**, and **MS. VICKIE BOMBA-LEWANDOSKI**, met with Dennis Geshel of DAS-BEST in the Slate Board Room for a demonstration of the state eLicense system, which the Experiment Station will soon be joining for apiary and nursery registration (August 23).



# CAES

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# STATION NEWS

**DR. KIMBERLY A. STONER** spoke as part of the Nursery and Landscape Research Tour at the Valley Laboratory on “The Push for Pollinators – Needs for Plants and Seeds” (30 attendees) (September 15); as part of the Urban Oasis program of Audubon Connecticut, worked with Chris Tuccio of the Naugatuck Valley Community College and 18 of his students, Chris Ozyck of the Urban Resources Initiative, and Barbara Yaeger of the Experiment Station Associates to install an Urban Oasis with a focus on pollinator plants on the grounds of the Experiment Station on the slope next to the Slate Building (see photographs of the installation) (September 20); and presented a poster, “Natural pollination is generally adequate for pumpkin and winter squash, *Cucurbita* spp., in Connecticut” at the XXV International Congress of Entomology in Orlando, FL (September 28).

## ENVIRONMENTAL SCIENCES

**DR. JOSEPH PIGNATELLO** and **DR. BLAIRE STEVEN** participated in a web phone conference on phosphorous cycling with potential collaborators from the University of Texas and University of California, Davis (September 16).

**DR. PHILIP ARMSTRONG** gave the talk “Zika Virus and Mosquitoes: Assessing the Threat” to the Department of Pathobiology at UCONN (30 attendees) (September 8); spoke and gave a tour to incoming students from the Yale School of Public Health, Epidemiology of Microbial Diseases Program (20 attendees) (September 20); spoke to the Connecticut Ground Keepers Association about mosquitoes and monitoring for Zika Virus (30 attendees) (September 21); and was interviewed by CT Radio Network about the detection of EEE virus in mosquitoes (September 22).

**MR. GREGORY BUGBEE** spoke on “Invasive Aquatic Plants in Candlewood Lake” at a multi-town meeting held at the Danbury Town Hall (approximately 40 attendees) (September 7); and gave a demonstration on invasive aquatic plants of Connecticut at the Southeast Connecticut Federation of Lakes Conference at Connecticut College, New London (approximately 40 attendees) (September 17).

**DR. HSIN-SE HSIEH** gave a talk “Activated carbon-mediated alkaline hydrolysis of alkyl halides (methyl bromide)” at the American Chemical Society National Meeting, Philadelphia PA (approximately 150 attendees) (August 22-24).

**DR. GOUDARZ MOLAEI** hosted Dr. Kaveh Khoshnood, of the Yale School of Public Health, and Tshering Dukpa, a research scientist from Bhutan, toured the facilities, and discussed research collaboration and training of Bhutan scientists in vector surveillance (September 26).

**DR. JOHN SOGHIGIAN** gave a talk, “Molecular phylogenetics of Aedini mosquitoes” at the XXV International Congress of Entomology, Orlando, FL (30 attendees) (September 30).

**MR. MICHAEL THOMAS** demonstrated insect collecting and preservation techniques to Terrestrial Arthropod classes of the University of Connecticut Entomology and Yale University at the Yale Forestry Camp in Norfolk (20 student attendees) (September 9-10).

**DR. CHARLES VOSSBRINCK** judged science exhibits at the 2016 BIG E AFFA Agriscience Fair (September 16).

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## FORESTRY AND HORTICULTURE

**DR. JEFFREY WARD** administered practical and oral examination to arborist candidates for the Connecticut Tree Protection Examining Board (September 7); as Chair-Elect, participated in Executive Committee meeting of the New England Society of American Foresters in Concord, NH (June 15); met with Debbie Surabian, Jacob Isleib, and Nels Barrett (NRCS) to discuss forest productivity (September 14); gave two webinars on "Roadside Forest Management: Tree-by-Tree" for the Cornell University ForestConnect series (125 attendees) (September 21); and was interviewed the effects of gypsy moths and drought on fall foliage color by Judy Benson for the New London Day (September 26).

**DR. ABIGAIL MAYNARD** gave two talks on composting to Sustainability classes at Hamden Hall Country Day School in Hamden (2 teacher, 25 students) (September 7); judged fruits and vegetables at the North Haven Fair (September 8); and spoke to 4 growers about the New Crops Program at the Hamden Farmer's Market (September 23).

**DR. SCOTT WILLIAMS** hosted a CAES informational table at the DEEP's First Annual Hunting and Fishing Day at Franklin Swamp Wildlife Management Area, North Franklin (200 attendees) (September 10); with **MR. MICHAEL SHORT** and **MS. MEGAN LINSKE**, conducted a small mammal trapping demonstration and deer exclosure explanation to students in the Wildlife Management Techniques class in the Department of Natural Resources and the Environment at the University of Connecticut, Storrs (10 students, 1 teacher) (September 12); with **MR. MICHAEL SHORT** and **MS. MEGAN LINSKE**, sampled deer exclosure vegetation with DEEP Wildlife Division Biologist Michael Gregonis and MDC Forester Andrew Hubbard for a multi-institutional collaborative deer browse research project, Barkhamsted (September 20); gave an invited lecture to the East Hartford Rotary Club on ticks and tick-borne diseases, East Hartford (40 attendees) (September 21); with **DR. KIRBY STAFFORD**, attended a graduate committee meeting of University of Connecticut Ph. D. student Megan Linske, Storrs (September 21); and attended the quarterly meeting of the Executive Board of the Connecticut Urban Forest Council, Hamden (September 30).

## PLANT PATHOLOGY AND ECOLOGY

**DR. SANDRA ANAGNOSTAKIS** attended the annual meeting of the federal chestnut project, NE 1333 in Syracuse, NY and reported on CAES chestnut holdings and valuable collections (42 adults attended) (September 29-October 2).

**DR. WADE ELMER** co-hosted the Connecticut Greenhouse Grower's Association (CGGA) meeting in Jones Auditorium (25 adults) (August 30) and attended the CGGA 'Evening at the Greenhouse' at Geremia Farms, Yalesville, CT (26 adults) (September 7).

**DR. YONGHAO LI** gave a talk about foliar diseases of spruce and their control at the Connecticut Christmas Tree Growers Association annual fall meeting in Hamden, CT (40 adults) (September 10); gave two presentations entitled 'Common Cultural/Disease Problems' and 'White Pines in the CT Landscape' at the Nursery & Landscape Research Tour in Windsor, CT (20 adults) (September 15); and was interviewed by Robert Miller at News Times about weather and fall color change in CT (September 12).

**DR. NEIL SCHULTES** attended the first class for the Yale Course Scie030 "Current Topics in Science" for which he will lecture (18 Undergraduate Students attended) (September 2); as vice president of the Sigma Xi Quinnipiac Chapter, met in an executive meeting at Quinnipiac University (September 8); and presented a lecture on "Factors that influence plant growth" to the Federated Garden Clubs Master Gardeners School in Jones Auditorium (35 people) (September 14).

**DR. LINDSAY TRIPLETT** moderated the Effector Biology Session at annual meeting of the American Phytopathological Society in Tampa, FL and as an invited speaker, gave the presentation entitled "Resistance of Carolina Gold Select Rice to African strains of *X. oryzae* pv. *oryzicola* is triggered by inactivated TAL effectors" (58 attendees) (August 3) and was interviewed by the Charleston (SC) Post and Courier on her research of disease resistance in heirloom rice for the article, "Could Carolina Gold be the answer to West Africa's rice woes?" (August 23).

**DR. QUAN ZENG** met with Dr. Steven Young, director of the Northeastern IPM center at Cornell University, and gave a research update of the ongoing projects with NEIPM center and a tour of the organic pesticide testing plot at Lockwood farm (September 14).



**DR. JATINDER S AULAKH** presented a talk on “Know Your Weeds- Identification of Invasive Trees and Vines in Connecticut” at Plant Science Day (August 3); attended the Connecticut Christmas Tree Growers twilight meeting and discussed herbicide options for the post-emergence control of broadleaf and grass weeds, and perennial woody vines in Christmas trees (August 17); attended the CIPWG meeting in Windsor, CT (August 23); attended the Connecticut Christmas Tree Growers annual meeting, Hamden, CT and demonstrated pre-emergence weed control efficacy trial and talked about weed management plans for the fall 2016 (September 10); and gave a demonstration on new herbicide safety trials in ornamental plants and talked about common weed problems in landscapes during the Valley Laboratory Nursery and Landscape Research Tour (20 attendees) (September 15).

**DR. RICHARD COWLES** presented “Neonicotinoid insecticides research results,” at the Valley Laboratory Nursery and Landscape Research Tour, Windsor (20 attendees) (September 15); spoke on “Emerald ash borer management” to the Public Works committee for the City of Hartford (12 attendees) (September 15); and spoke on “Chemical control of emerald ash borer” at an EAB workshop hosted by the Connecticut Tree Protective Association, Monroe (60 attendees) (September 22).

**MS. ROSE HISKES** organized and spoke at the Nursery and Landscape Research Tour at the Valley Laboratory, The Connecticut Agricultural Experiment Station (September 15, 18 attendees); with Katherine Dugas and volunteer Daria Chamerda, led a team of Vernon Greenways volunteers along the Rail Trails in Vernon to look for Emerald Ash Borer and Asian Longhorned Beetle on maple, ash, willow, horsechestnut, birch and elm trees (September 17, 5 volunteers); with Katherine Dugas and Mark Creighton staffed a Station Booth at the Big E in West Springfield, MA. (September 22).

**DR. JAMES LAMONDIA** examined candidates for the Connecticut arborist license and participated in the quarterly meeting of the Connecticut Tree Protection Examining Board in New Haven (September 7); met with State Representative Melissa Ziobron to discuss industrial hemp research (September 13); spoke about developments in management of boxwood blight at the Valley Lab Nursery and Landscape Research Tour (18 attendees) (September 15); spoke about ‘Hop research and production in Connecticut’ to the Eastern region International Plant Propagators’ Society in Hartford (65 attendees) (September 24); and taught a class on identification, biology and management of tree diseases to students in the Connecticut Tree Protective Association’s Arboriculture 101 class in Wallingford (42 attendees) (September 28).

**DR. KATJA MAURER** presented a talk titled "Growing Hops in Connecticut" at the Nursery and Landscape Research Tour at the Valley Laboratory (18 attendees) (September 15).



Ma, C.; Liu, H.; Guo, H.; Musante, C.; Coskun, S.H.; Nelson, B.C.; White, J.C.; Dhanker, O.P.; Xing, B. 2016. Defense mechanisms and nutrient displacement in *Arabidopsis thaliana* upon exposure to CeO<sub>2</sub> and In<sub>2</sub>O<sub>3</sub> nanoparticles. *ES: Nano*. DOI: 10.1039/C6EN00189K.

**Abstract-** Metal-based nanoparticles (NPs) can cause toxicity to the terrestrial plants; however, there is little understanding of plant defense mechanisms that may counteract nanotoxicity. In the present study, we investigated the defense mechanisms of *Arabidopsis thaliana* in response to cerium oxide (CeO<sub>2</sub>) and indium oxide (In<sub>2</sub>O<sub>3</sub>) NPs exposure. Excessive amounts of total reactive oxygen species (ROS) were measured upon exposure to both NPs, demonstrating clear oxidative stress in *Arabidopsis*. Analysis of ROS scavenger activity (SOD, CAT, APX, and POD) indicated that the process of removing ROS in *Arabidopsis* treated with different concentrations of CeO<sub>2</sub> and In<sub>2</sub>O<sub>3</sub> NPs was different. In addition, the activities of two important enzymes involved in the glutathione (GSH) metabolic pathway, glutathione S-transferase (GST) and glutathione reductase (GR), as well as the transcription levels of their respective gene, were also measured. Moreover, the activities of phenylalanine ammonia-lyase (PAL) and polyphenol oxidase (PPO) in the secondary metabolic pathway were highly induced in response to both types of NPs. Both NPs disrupted the uptake of elemental nutrients. Furthermore, both NPs caused iron deficiency in *Arabidopsis* root tissues at select exposure concentrations. These results were further confirmed by analyzing the transcription levels of three iron transporters (FRO, IRT, and FER) at different time points. The findings provide useful mechanistic information for plant detoxification pathways after NPs exposure.

Marmiroli, N.; White, J.C. 2016. Editorial: Nanotoxicology and environmental risk assessment of engineered nanomaterials (ENMs) in plants. *Front. Plant Sci.* 7:1370.

**Abstract-** In the last two decades, the development and application of nanotechnology- the science of small- has increased dramatically, impacting sectors as far reaching as medicine (including disease treatment and diagnosis), energy, communications, water treatment and food production. By 2020, the projected global market value for nanotechnology will exceed \$3 trillion. In spite of these incredible advances, the general consensus among the scientific community is that our understanding of the fate and effects of these novel materials in the environment is inadequate. Given the level of current and projected exposure to both human and non-human receptors, this basic lack of understanding with regard to ENM environmental health and safety (EHS) is highly disconcerting. The articles contributed as part of this research topic are indicative of the current work being done to begin to address some of these key knowledge gaps, specifically focusing on impacts of ENM exposure to terrestrial plant species and food crops. The papers address a range of topics, including effects on key plant species measured at both the physiological and molecular level, and present a description of some important analytical platforms by which to assess exposure; single particle inductively coupled mass spectrometry (sp-ICP-MS) and proteomics. Two articles specifically address ENM impacts on foods nutritional content and on dietary intake. A final review article assesses the current use of carbon nanomaterials in agriculture, including a description of key research areas where more work is sorely needed.

Zhang, Z.; Guo, H.; Carlisle, T.; Mukherjee, A.; Kinchla, A.; White, J.C.; Xing, B.; He, L. 2016. Evaluation of postharvest washing on Ag NPs removal from spinach leaves. *J. Agric. Food Chem.* 64:6916-6922.

**Abstract-** There is increasing use of silver nanoparticles (Ag NPs) as pesticides for fruits and vegetables due to the particles unique antimicrobial and insecticidal properties. However, residual Ag NPs in harvested produce may transfer through the food chain and pose a potential risk to public health. The objective of this study is to determine whether postharvest washing can remove Ag NPs that had accumulated on fresh produce. Commercially available 40 nm citrate coated Ag NPs (4×10<sup>-4</sup> mg) were applied to spinach leaves, followed by washing with deionized water (DI water), Tsunami® 100 (80 mg L<sup>-1</sup>) or Clorox® bleach (200 mg L<sup>-1</sup>). Then, AgNPs removal efficiency of the three treatments was evaluated by surface enhanced Raman spectroscopy (SERS), scanning electron microscopy (SEM)-energy dispersive spectrometer (EDS), and inductively coupled plasma mass spectrometry (ICP-MS). ICP-MS results showed that deionized water removed statistically insignificant amounts of total Ag, whereas Tsunami® 100 and Clorox® bleach yielded 21% and 10% decreases in Ag, respectively (P < 0.05). The increased

removal efficiency resulted from Ag NPs dissolution and Ag<sup>+</sup> release upon contact with the oxidizing agents in Tsunami® 100 (peroxyacetic acid, hydrogen peroxide) and Clorox® bleach (sodium hypochlorite). According to SERS results, the deionized water and Tsunami® 100 treatments removed non-significant amounts of AgNPs, whereas Clorox® bleach decreased Ag NPs by more than 90% (P < 0.05). SEM-EDS images revealed the formation of large silver chloride (AgCl) crystals (over 200 nm) with Clorox® bleach treatment. This study demonstrates low Ag NPs removal efficacy with routine postharvest washing of produce and highlights the necessity to develop an efficient washing method for NP removal from food surfaces in the future.

TRIPLETT, L.R., S.P. Cohen, C. Heffelfinger, C.L. Schmidt, C. Tekete, V. Verdier, A.J. Bogdanove, and J.E. Leach. A resistance locus in the American heirloom rice variety Carolina Gold Select is triggered by diverse TAL effectors and is effective against African strains of *Xanthomonas oryzae* pv. *oryzicola*. *Plant Journal* **87**:472-483.

**Abstract-** The rice pathogens *Xanthomonas oryzae* pathovar (pv.) *oryzae* and pv. *oryzicola* produce numerous transcription activator-like (TAL) effectors that increase bacterial virulence by activating expression of host susceptibility genes. Rice resistance mechanisms against TAL effectors include polymorphisms that prevent effector binding to susceptibility gene promoters, or that allow effector activation of resistance genes. This study identifies, in the heirloom variety Carolina Gold Select, a third mechanism of rice resistance involving TAL effectors. This resistance manifests through strong suppression of disease development in response to diverse TAL effectors from both *X. oryzae* pathovars. The resistance can be triggered by an effector with only 3.5 central repeats, is independent of the composition of the repeat variable di-residues that determine TAL effector binding specificity, and is independent of the transcriptional activation domain. We determined that the resistance is conferred by a single dominant locus, designated *Xo1*, that maps to a 1.09 Mbp fragment on chromosome 4. The *Xo1* interval also confers complete resistance to the strains in the African clade of *X. oryzae* pv. *oryzicola*, representing the first dominant resistance locus against bacterial leaf streak in rice. The strong phenotypic similarity between the TAL effector-triggered resistance conferred by *Xo1* and that conferred by the tomato resistance gene *Bs4* suggests that monocots and dicots share an ancient or convergently evolved mechanism to recognize analogous TAL effector epitopes.

## JOURNAL ARTICLES APPROVED SEPT. 2016

Anderegg, W. R. L., A. Wolf, **Adriana Arango-Velez**, C. Brendan, D. J. Chmura, S. Jansen, T. Kolb, S. Li, F. Meinzer, et al. Stomata are regulated to manage hydraulic damage: empirical evidence and global consequences. *Science*

**Cheah, Carole A. S-J.** Potential biological control of armored scales in Christmas tree plantations. *The Real Tree Line* (CCTGA Newsletter)

**Cheah, Carole A. S-J.** and D. Ellis. Biological control of mile-a-minute weed, *Polygonum perfoliatum*, in Connecticut. *Proceedings of the CIPWG Invasive Plant Symposium*

Deng, Y., **Brian Eitzer, Jason C. White**, and B. Xing. Impact of multiwall carbon nanotubes on the accumulation and distribution of carbamazepine in collard greens (*Brassica oleracea*). *Environmental Science: Nano*

**Dingman, Douglas W.** Functionality of Tn916 in *Paenibacillus larvae*. *Journal of Apicultural Research*

**LaMondia, James A.** Susceptibility of *Pachysandra* species and cultivars to the boxwood blight pathogen *Calonectria pseudonaviculata*. *Phytopathology* (Abstract)

**LaMondia, James A.** and N. Shishkoff. Susceptibility of boxwood accessions from the National Boxwood Collection to boxwood blight and potential for differences between *Calonectria pseudonaviculata* and *C. henricotiae*. *Plant Disease*

Li, T., **Charles R. Vossbrinck**, J. S. Xu, G. Q. Pan, M. Yang, X. F. Xu, B. A. Debrunner-Vossbrinck, and Z. Y. Zhou. SilkPathDB: a comprehensive resource for the study of silkworm pathogens. *Bioinformatics*

**Maurer, Katja A.** and **James A. LaMondia.** Evaluation of hop cultivation feasibility in Connecticut based on yield, growing characteristics, and susceptibility to diseases and pests. *Phytopathology* (Abstract)

**Maurer, Katja A.** and **James A. LaMondia.** Fungicide sensitivity of *Calonectria pseudonaviculata*, causal agent of boxwood blight, in Connecticut. *Phytopathology* (Abstract)

**Maurer, Katja A.**, A. B. DeFrancesco, and **James A. LaMondia.** Evaluation of hop cultivation feasibility in Connecticut. *Proceedings of the International Plant Propagators Society, Acta Horticulturae*

Patel, R. R., G. W. Sundin, C. H. Yang, J. Wang, **Regan B. Huntley**, and **Quan Zeng.** Peptide nucleic acid (PNA) in conjugation with cell penetrating peptide (CPP) causes silencing of an essential gene in fire blight pathogen *Erwinia amylovora* and inhibits pathogen growth. *Frontiers in Microbiology*

Servin, A. D., L. Pagano, H. Castillo-Michel, **Roberto De La Torre-Roche**, **Joseph Hawthorne**, J. A. Hernandez-Viezcas, R. Loreda, **Sanghamitra Majumdar**, J. Gardea-Torresdey, O. Parkash Dhankher, and **Jason C. White.** Weathering in soil increases nanoparticle CuO bioaccumulation within a terrestrial food chain. *Nanotoxicology*

**Steven, Blaire**, C. Hesse, L. V. Gallegos-Graves, and J. Dunbar. In silico simulated ribosomal RNA:DNA ratios show potential to misclassify active populations as dormant. *Applied and Environmental Microbiology*

**Stoner, Kimberly A.** Current pesticide risk assessment protocols do not adequately address differences between honey bees (*Apis mellifera*) and bumble bees (*Bombus* spp.). *Frontiers in Environmental Science*

Wu, B. Y., J. R. Ye, L. Huang, L. M. He, and **De-Wei Li.** RT-qPCR analysis of two-component signal transduction system (TCS) gene expression of *Burkholderia pyrrocinia* JK-SH007. *Journal of Microbiological Methods*



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# STATION NEWS

## GRANTS RECEIVED SEPTEMBER 2016

**DR. LINDSAY TRIPLETT**, in collaboration with two professors at Southern CT State University, was recommended for \$261,000 in funding by the USDA-NIFA Education and Literacy Initiative to establish a research internship program for undergraduates at CAES and SCSU in the summers of 2017-2019.



**ARTICLES OF INTEREST SEPTEMBER 2016**

Attendees begin to file in for the opening plenary session at the XXV International Congress of Entomology in Orlando, FL on September 25, 2016.



Installation of the Urban Oasis garden at CAES, September 20, 2016.



JOSEPH P. BARSKY discussing forest health at the Station display at the Durham Fair





## NURSERY & LANDSCAPE RESEARCH TOUR

Eighteen people attended the Valley Laboratory Nursery and Landscape Research Tour held on September 15, 2016. Dr. Jim LaMondia welcomed growers prior to a walking tour of plots on the farm. On the tour, Dr. Carole Cheah gave an update on biological control of HWA in CT, Katja Maurer spoke about hops as a new crop for Connecticut, Thomas Rathier spoke about water issues in soils and the landscape, Dr. Jatinder Aulakh spoke about crop safety herbicide trials for container ornamentals and Jim LaMondia spoke about developments in management of boxwood blight. Talks presented in the G.S. Taylor Conference Room included 'Neonicotinoid insecticides research results' by Dr. Richard Cowles, 'Common cultural/disease problems 2015 -16' by Dr. Yonghao Li, and Rose Hiskes, 'Common insect/herbicide problems 2015 -16' by Ms. Rose Hiskes and Dr. Jatinder Aulakh, and 'Push for pollinator habitat: Needs for plants and seeds' by Dr. Kim Stoner. Isaac Buabeng, Daria Chamerda and Jim Preste assisted with much of the behind the scenes work for the meeting. The meeting qualified for pesticide applicator re-certification.

## PERSONAL

**PETER THIEL** became a new first-time grandfather to Chloe Rose Thiel on August 22, darling daughter of Kate and Alex Thiel, of Cheshire, CT. She was 5 lb 6 oz, and 18 ½ inches. Mother and baby are doing fine.

## NEW EQUIPMENT

The large drying oven in Slate room 110 has been removed and replaced with a new Heratherm oven. The new oven will be housed in Jenkins-Waggoner room 008, also known as the autoclave room. It will feature slightly more capacity, programmability, timer, alarm, and much greater efficiency. It is due to arrive around October 20, with installation to follow.



# CAES

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## The Connecticut Agricultural Experiment Station

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Main Laboratories, New Haven



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Station News was prepared and edited by Dr. Theodore G. Andreadis and Mrs. Vickie Bomba-Lewandoski.

Volume 6 Issue 10  
October 2016

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