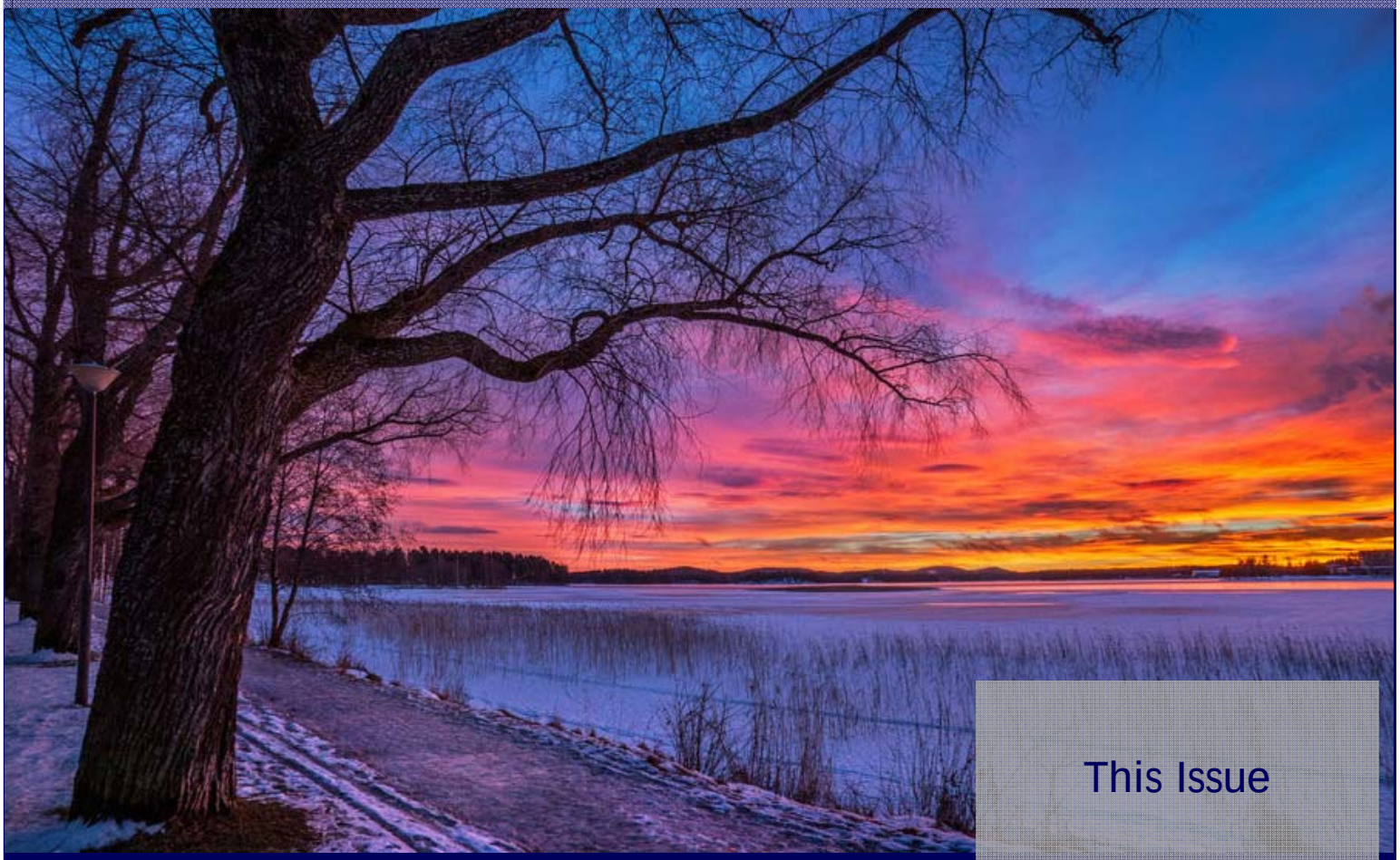
Station News

The Connecticut Agricultural Experiment Station
Volume 7 Issue 1 January 2017



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

DR. THEODORE ANDREADIS presented a talk entitled, "Life cycle and pathology of a novel microsporidian parasite isolated from the invasive exotic mosquito, *Aedes japonicus* from Japan", at the 62nd[h] Annual Meeting of the Northeastern Mosquito Control Association held in Falmouth, MA (December 6, 180 attendees) and presented an overview of the Experiment Station and its various research, regulatory and public service programs to a group of students from Norwich Technical High School (December 20).

MRS. VICKIE BOMBA-LEWANDOSKI attended training sessions for FE3 (Facilitating Environmental Excellence), Project WET Workshop, Kellogg Environmental Center, Derby (December 7); participated in FE3 (Facilitating Environmental Excellence) Facilitator Training, Electronic Seminar and Training for FE3 (December 13); and hosted a tour from Norwich Technical High School (20 high school students, 3 teachers) (December 20).

ANALYTICAL CHEMISTRY

DR. JASON C. WHITE attended the monthly Laboratory Preparedness meeting at the CT Department of Public Health Laboratory in Rocky Hill CT (December 5); along with **MR. MICHAEL CAVADINI, MR. JOSEPH HAWTHORNE, and MR. CRAIG MUSANTE,** participated in an FDA webinar on data reporting requirements for an upcoming FERN assignment involving elemental analysis of milk for export to the European Union (December 7); along with **MR. MICHAEL CAVADINI, MR. JOSEPH HAWTHORNE, DR. WALTER KROL, MR. CRAIG MUSANTE, DR. BRIAN EITZER, and MS. TERRI ARSENAULT** participated in the monthly FDA FERN cCAP teleconference call (December 8); along with **DR. WADE ELMER** met with a reporter (Ms. Anna Bisaro) of the New Haven Register to discuss recent work on the use of nanoscale nutrients to suppress crop disease (December 9); along with **DR. NUBIA ZUVERZA-MENA and KITTY PRAPAYOTIN-RIVEROS** participated in a quarterly teleconference call with LCDR Ruiqing Pamboukian, Ph.D. of the US FDA regarding progress in the Department's AFRPS grant (December 13); participated in an APHL-sponsored teleconference call regarding a peer reviewed manuscript submission focused on nanotechnology and water treatment to the *Journal of the American Water Works Association* (JAWWA) (December 19); gave a tour of Department laboratories and described programs to a group of students and faculty from the Norwich Technical High School (December 20); hosted Professor Baoshan Xing of the University of Massachusetts Stockbridge School of Agriculture (and 12 member of his staff) for the CAES Seminar Series and discussed ongoing collaborative research projects (December 21); participated in a Skype call with Ms. Jinfeng of Nanjing Agricultural University regarding her conducting her Ph.D. research on nanotoxicology at CAES beginning next year (December 23); the CAES Department of Analytical Chemistry was awarded ISO 17025/IEC Accreditation from the American Association for Laboratory Accreditation (A2LA) (December 28); and hosted the Department of Agriculture Commissioner Steven Reviczky and staff, as well as growers from several CT farms, to discuss the US FDA Produce Safety Rule (December 29).

DR. BRIAN D. EITZER was a participant in the North American Chemical Residue Workshop's organizing committee's conference call (December 8).

MS. TERRI ARSENAULT was an invited guest lecturer for the LB508 FDA/Food Emergency Response Network Chemistry Training for Gas Chromatography – Mass Spectrometry (GC-MS) held at the Arizona Department of Health Services in Phoenix, AZ (December 13-15).

Members of the **Department of Analytical Chemistry** celebrating the awarding of ISO 17025/IEC Accreditation for our FDA Manufactured Food Regulatory Program by the American Association for Laboratory Accreditation (A2LA).

Ms. Terri Arsenault was a guest lecturer for the FDA LB508 FDA/Food Emergency Response Network Chemistry Training for Gas Chromatography – Mass Spectrometry (GC-MS) held at the Arizona Department of Health Services in Phoenix, AZ.

ENTOMOLOGY

DR. KIRBY C. STAFFORD III participated in the oral examination **MS. MEGAN LINSKE** at UConn (December 5): participated in the conference call of the tick IPM working group (December 14); and participated in a meeting at DEEP on aerial spraying for gypsy moth (December 21).

MR. MARK H. CREIGHTON met with students from the Common Ground High School at West Rock Nature Center to continue site preparation for a new apiary (December 1); met with an Honors Student on a Honey Bee Research Project at the Woodbridge Library, Woodbridge (December 8) and presented a talk with beekeepers on the strategies for overwintering Honey bee colonies in CT (38 attendees) (December 18).

DR. GALE E. RIDGE presented a bed bug talk to Carr Property Management in Springfield MA (65 attendees) (December 6) and conducted a field visit to the Avon Old Farms School, Avon to inspect and advise on managing an infestation of bed bugs in a 150 year old wood only dormitory (December 21).

DR. CLAIRE E. RUTLEDGE assisted in administering the oral portion of the State Arborist Licensing Exams in New Haven (December 7) and talked with students from Nonnewaug High School in Woodbury about invasive insects at the USDA Forest Service Quarantine Facility in Ansonia, CT (26 youth, 3 adults) (December 9).

DR. VICTORIA L. SMITH participated in a meeting of the Yale Biosafety Committee, held at 135 College Street, New Haven (20 participants) (December 15).

DR. KIMBERLY A. STONER met at Connecticut Department of Transportation headquarters in Newington with John DeCastro, Transportation Maintenance Manager, Adam Boone, Transportation Landscape Designer, and others from the CT DOT about the requirement in the pollinator health act that CT DOT designate areas along roadways to be transitioned to native plants suitable for pollinators (14 attendees) (December 7) and spoke on “Increasing Pollinators by Increasing Plant Diversity” at the Annual CT NOFA Organic Land Care Meeting, Southington, CT (135 attendees) (December 9).

ENVIRONMENTAL SCIENCES

DR. PHILIP ARMSTRONG gave the talk "Isolation of La Crosse virus from mosquitoes collected in Connecticut" at the Annual Northeastern Mosquito Control Association Meeting in Falmouth, MA (180 attendees) (December 5).

DR. DOUG BRACKNEY presented the poster "The role of autophagy during dengue virus, Zika virus and chikungunya virus infection of Aedes aegypti mosquitoes" at the Cellular Stress Responses and Infectious Agents Keystone Symposium, Santa Fe, NM (December 4-8).

MR. GREGORY BUGBEE gave the talk "Invasive Aquatic Plants: The State of the State" at a meeting of the Northeast Nuisance Aquatic Species Panel in the Jones Auditorium (December 1) (approx. 20 attendees); hosted and gave welcoming remarks to a meeting of the Connecticut and Massachusetts Water Chestnut Working Group at the Valley Laboratory (approximately 40 attendees) (December 7); and, with **MS. JENNIFER FANZUTTI**, gave an Aquatic Plant Workshop to CTDEEP staff at the CTDEEP water monitoring facility in Windsor (approximately 12 attendees) (December 13).

MS. JENNIFER FANZUTTI, with **MR. GREGORY BUGBEE**, attended a meeting at the CAES Windsor campus on Water Chestnut control in the Connecticut River Watershed (December 7); and, with Greg Bugbee, spoke to the CT DEEP Water Laboratory staff in Windsor on Invasive Aquatic Plant Identification (approximately 12 attendees) (December 13).

DR. GOUDARZ MOLAEI gave an invited talk, "A Feathery Tale of Close Encounters: Avian Hosts as Super-spreaders of Eastern Equine Encephalitis Virus", and co-authored an invited talk by **MR. JOHN SHEPARD**, "Vector-Host Interactions of Other Evil Mosquito Species at Eastern Equine Encephalitis Virus Foci" at the Annual Meeting of the Northeastern Mosquito Control Association, Falmouth, MA (180 attendees) (December 5); and conducted a tour of the Tick Testing Laboratory for students from Norwich Technical High School, Norwich, CT (20 student attendees) (December 20).

DR. JOHN SOGHIGIAN gave the talk "Molecular Phylogenetics and Evolution of Habitat Specialization in Aedini Mosquitoes" at the Northeastern Mosquito Control Association, Falmouth, MA (180 attendees) (December 5).

MR. JOHN SHEPARD gave two invited talks, "Arbovirus Activity in Connecticut, 2016," and "Vector-Host Interactions of Other Evil Mosquito Species at Eastern Equine Encephalitis Virus Foci" at the Annual Meeting of the Northeastern Mosquito Control Association in Falmouth, MA (180 attendees) (December 5-7).

FORESTRY AND HORTICULTURE

DR. JEFFREY S. WARD gave invited lecture on "Improving competitive status of oak regeneration using stand management and prescribed fires" for a forest ecology class at Wesleyan University in Middletown (16 students) (December 1); administered practical and oral examination to arborist candidates for the Connecticut Tree Protection Examining Board (December 7); met with Debbie Surabian (NRCS), Jacob Isleib, and Nels Barrett (NRCS) and Janet and Paul Bryant to discuss forest stand dynamics (December 13); participated in New England Society of American Foresters Executive Committee conference call (December 14); met with Doreen Abubaker, Elm City Parks Conservancy, to discuss trees along Learning Corridor on Farmington Canal Linear Trail in Newhallville (December 19).

DR. ADRIANA ARANGO VELEZ gave a talk “Effect of Insects and Pathogens in Plant Performance” to the Norwich Technical High School students (24 students, 2 teachers) (December 20).

DR. ABIGAIL A. MAYNARD Visited Rose’s berry farm in South Glastonbury and discussed the New Crops program (December 21).

DR. SCOTT C. WILLIAMS met with UConn Master’s degree student Carolyn Miller about collaborative research opportunities at CAES (December 19); with **DR. KIRBY STAFFORD**, participated in the successful completion of the oral component of the comprehensive examination for UConn Ph. D. candidate advisee **MS. MEGAN A. LINSKE** (December 5).

MR. JOSEPH P. BARSKY participated in New England Society of American Foresters Executive Committee conference call (December 14); gave a presentation on "Sugar Maple Research" in CAES Greenhouse to the Norwich Technical High School students (24 students, 2 teachers) (December 20).

PLANT PATHOLOGY AND ECOLOGY

DR. WADE ELMER met with Dr. Victor S. Batista. Professor of Chemistry and Dr. Lisa D. Pfefferle, Professor of Chemical & Environmental Engineering at Yale University to discuss practical application of engineered nanotubes in plants (December 5); along with **DR. JASON WHITE** was interviewed by Ms. Anna Bisaro of the New Haven Register on the use of nanoparticles to suppress plant diseases (December 9).

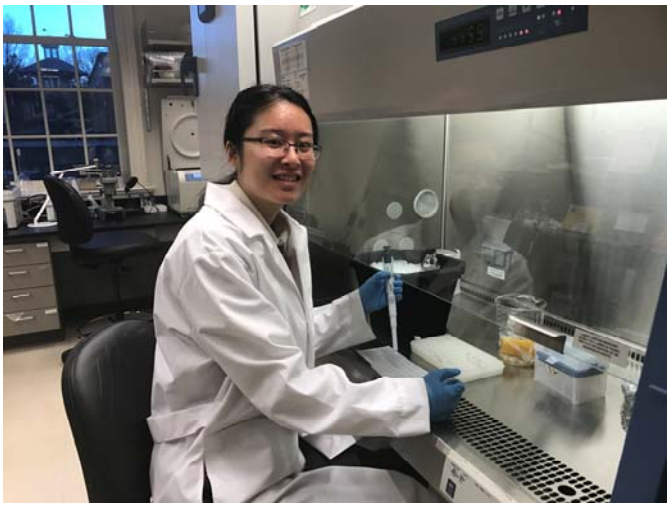
DR. YONGHAO LI presented a talk about 'Houseplants – General Care and Diagnosis of Common Problems' for the Spring Glen Garden Club in Hamden, CT (10 adults) (December 12); along with **MS.LINDSAY PATRICK,** talked about Plant Disease Information Office to the students from Norwich Technical High School during the CAES tour in New Haven, CT (20 youth) (December 20).

DR. ROBERT MARRA participated with fellow members of the Steering Committee for the Connecticut Conference on Natural Resources in a planning meeting at the University of Connecticut, Storrs to structure the 2017 Conference, to be held on March 13, 2017 on the UConn Storrs campus (December 13).

DR. NEIL SCHULTES presented his last presentations for the class series "Genetically Modified Plants in Agriculture" to Science Course Sci 031 at Yale University, (December 2 and 9_ (6 students attended); participated as vice president of the Sigma Xi Quinnipiac Chapter in an executive meeting on December 16 at Quinnipiac University

DR. QUAN ZENG visited Shanghai Jiaotong University, gave an invited presentation "Bistable gene expression of the type III secretion system genes in plant pathogenic bacteria" (23 attendants); met Dr. Lifang Zou and Dr. Gongyou Chen and discussed putative areas of collaboration (December 27); and toured the School of Agriculture and Biology, experimental farm, and research facilities at Minhang campus (December 28-29).

DR. ZHOUQI CUI joined **DR. QUAN ZENG'S** laboratory at the Department of Plant Pathology and Ecology as a postdoctoral researcher starting in December 2016. Dr. Cui received her B.S. degree from Nanjing Agricultural University in horticulture and her Ph.D. degree from Zhejiang University in Plant Pathology. Her PhD thesis studied the pathogen of bacterial panicle blight of rice, *Burkholderia glumae*. Her research at CAES will focus on understanding the mechanism of bistable gene expression of the type III secretion system in bacterial plant pathogens. Zhouqi will work at the station for one year.



VALLEY LABORATORY

DR. JAMES LAMONDIA was interviewed about hops research and the Specialty Crop Block Grant hop project by Anna Bisaro of the New Haven Register (December 6); participated in the quarterly meeting of the Connecticut Tree Protection Examining Board in New Haven (December 7); and spoke about Valley Lab research and services and conducted a tour of the Lab and farm for Water Chestnut Practitioners (December 7); interviewed about potential value of a new biological fungicide for tobacco by Julia Ellis for Tobacco Farm Quarterly (December 22).

Zhang, K.; Schaab, M.R.; Tor' E.R.; Aston, L.; Song, W.; **Eitzer, B.**; **Majumdar, S.**; Lapainis, T.; Mai, H.; Tran, K.; El-Demerdash, A.; Vega, V.; Cai, Y.; Wong, J.W.; Krynitsky, A.J.; Begley, T.H.; Southwood, G. 2016. A Collaborative Study: Determination of Mycotoxins in Corn, Peanut Butter, and Wheat Flour using Stable Isotope Dilution Assay (SIDA) and Liquid Chromatography-Tandem Mass Spectrometry (LC-MS/MS).
J. Agric. Food Chem., DOI: 10.1021/acs.jafc.6b04872

Abstract. A collaborative study was conducted to evaluate stable isotope dilution assay (SIDA) and LC-MS/MS for the simultaneous determination of aflatoxin B_1, B_2, G_1 and G_2; deoxynivalenol; fumonisin B_1, B_2, B_3; ochratoxin A; HT-2 toxin; T-2 toxin; and zearalenone in foods. Samples were first fortified with twelve ^{13}C uniformly labeled mycotoxins (^{13}C-IS) corresponding to the native mycotoxins and extracted with acetonitrile/water (50/50: v/v), followed by centrifugation, filtration and LC-MS/MS analysis. In addition to certified reference materials, the six participating laboratories also analyzed corn, peanut butter, and wheat flour fortified with the twelve mycotoxins at concentrations ranging from 1.0-1,000 ng/g. Using their available LC-MS platform, each laboratory developed in-house instrumental conditions for analysis. The majority of recoveries ranged from 80-120% with relative standard derivations (RSDs) < 20%. Greater than 90% of the average recoveries of the participating laboratories were in the range of 90 - 110%, with repeatability RSD_r (within lab) <10% and reproducibility RSD_R (among labs) <15%. Using ^{13}C-IS eliminated the need for matrix-matched calibration standards for quantitation, simplified sample preparation, and achieved simultaneous identification and quantitation of multiple mycotoxins in a simple LC-MS/MS procedure.

Mukherjee, A.; **Hawthorne, J.**; **White, J.C.**; Kelsey, J.W. 2017. Nanoparticle Ag co-exposure reduces the accumulation of weathered persistent pesticides by earthworms. *Environ. Tox. Chem*. doi:10.1002/etc.3698.

Abstract. Although the use of engineered nanomaterials continues to increase, an understanding of how these materials interact with co-existing contaminants in the environment is largely unknown. Here, the effect of Ag in bulk, ionic, and nanoparticle (NP; bare and polyvinyl pyrrolidone coated) form at 3 concentrations (0, 500, 1000, 2000 mg/kg; ion at 212, 106, 53 mg/kg) on the accumulation of field weathered chlordane and dichlorodiphenyldichloroethylene + metabolites (DDX) by Eisenia fetida (earthworm) was investigated. Earthworm biomass and survival was unaffected by treatment. At the 500 and 1000 exposure levels, NP- exposed earthworms contained significantly greater Ag (194-245%) than did the bulk exposed organisms; NP size or coating had no impact on element content. Generally, exposure to Ag of any type or at any concentration significantly reduced pesticide accumulation, although reductions for DDX (35.1%; 8.9-47.0%) were more modest than those for chlordane (79.0%; 17.4-92.9%). For DDX, the reduction in pesticide accumulation was not significantly affected by Ag type or concentration. For chlordane, the three NP exposures suppressed chlordane accumulation significantly more than did bulk exposure; earthworms exposed to bulk Ag contained 1,170 ng/g chlordane but levels in the NP-exposed earthworms were 279 ng/g. At the 500 mg/kg exposure, the smallest coated NPs exerted the greatest suppression in chlordane accumulation; at the two higher, chlordane uptake was unaffected by NP size or coating. The findings show that in exposed earthworms, Ag particle size does significantly impact accumulation of the element itself, as well as that of co-existing weathered pesticides. The implications of these findings with regard to nanparticle exposure and risk are unknown but are the topic of current investigation.

Servin, A.D.; Pagano, L.; Castillo-Michel, H.; **De La Torre-Roche, R.**; **Hawthorne, J.**; Hernandez-Viezcas, J.A.; Loredo, R.; Majumdar, S.; Gardea-Torresdey, J.; Parkash-Dhankher, O.; **White, J.C.** 2017. Weathering in soil increases nanoparticle CuO bioaccumulation within a terrestrial food chain. *Nanotoxicol*. http://dx.doi.org/10.1080/17435390.2016.1277274.

Abstract. This study evaluates the bioaccumulation of unweathered (U) and weathered (W) CuO in NP, bulk and ionic form (0-400 mg/kg) by lettuce exposed for 70 d in soil co-contaminated with field incurred chlordane. To evaluate CuO trophic transfer, leaves were fed to crickets (Acheta domestica) for 15 d, followed by insect feeding to lizards (Anolis carolinensis). Upon weathering, the root Cu content of the NP

treatment increased 214% (327 + 59.1 mg/kg) over unaged treatment. Cu root content decreased in bulk and ionic treatments from 70-130 mg/kg to 13-26 mg/kg upon aging in soil. Micro x-ray fluorescence (µ-XRF) analysis of W-NP-exposed roots showed a homogenous distribution of Cu (and Ca) in the tissues. Additionally, micro x-ray absorption near-edge (µ-XANES) analysis of W-NP-exposed roots showed near complete transformation of CuO to Cu (I)-sulfur and oxide complexes in the tissues, whereas in unweathered treatment, most root Cu remained as CuO. The expression level of 9 genes involved in Cu transport show that the mechanisms of CuO NPs (and bulk) response/accumulation are different than ionic Cu. The chlordane accumulation by lettuce upon co-exposure to CuO NPs significantly increased upon weathering. Conversely, bulk and ionic exposures decreased pesticide accumulation by plant upon weathering. The Cu cricket fecal content from U-NP-exposed insects was significantly greater than the bulk or ion treatments, suggesting a higher initial NP accumulation followed by significantly greater elimination during depuration. In the lizard, Cu content in the intestine, body and head did not differ as a function of weathering. This study demonstrates that CuO NPs may undergo transformation processes in soil upon weathering that subsequently impact NPs availability in terrestrial food chains.

Stoner, K.A. 2016. Current Pesticide Risk Assessment Protocols Do Not Adequately Address Differences Between Honey Bees (*Apis mellifera*) and Bumble Bees (*Bombus* spp.). Front. Environ. Sci. doi: 10.3389/fenvs.2016.00079

Abstract. Recent research has demonstrated colony-level sublethal effects of imidacloprid on bumble bees affecting foraging and food consumption, and thus colony growth and reproduction, at lower pesticide concentrations than for honey bee colonies. However, these studies may not reflect the full effects of neonicotinoids on bumble bees because bumble bee life cycles are different from those of honey bees.

Unlike honey bees, bumble bees live in colonies for only a few months each year. Assessing the sublethal effects of systemic insecticides only on the colony level is appropriate for honey bees, but for bumble bees, this approach addresses just part of their annual life cycle.

Queens are solitary from the time they leave their home colonies in fall until they produce their first workers the following year. Queens forage for pollen and nectar, and are thus exposed to more risk of direct pesticide exposure than honey bee queens. Almost no research has been done on pesticide exposure to and effects on bumble bee queens.

Additional research should focus on critical periods in a bumble bee queen's life which have the greatest nutritional demands, foraging requirements, and potential for exposure to pesticides, particularly the period during and after nest establishment in the spring when the queen must forage for the nutritional needs of her brood and for her own needs while she maintains an elevated body temperature in order to incubate the brood.

Grubaugh, Nathan D.; Rückert, Claudia; **Armstrong, Philip M.**; **Bransfield, Angela**; **Anderson, John F.**; Ebel, Gregory D.; **Brackney, Doug E.** "Transmission bottlenecks and RNAi collectively influence tick-borne flavivirus evolution" *Virus Evolution*, 2(2): http://dx.doi.org/10.1093/ve/vew033. December 27, 2016.

Abstract. Arthropod-borne RNA viruses exist within hosts as heterogeneous populations of viral variants and, as a result, possess great genetic plasticity. Understanding the micro-evolutionary forces shaping these viruses can provide insights into how they emerge, adapt, and persist in new and changing ecological niches. While considerable attention has been directed toward studying the population dynamics of mosquito-borne viruses, little is known about tick-borne virus populations. Therefore, using a mouse and *Ixodes scapularis* tick transmission model, we examined Powassan virus (POWV; Flaviviridae, Flavivirus) populations in and between both the vertebrate host and arthropod vector. We found that genetic bottlenecks, RNAi-mediated diversification, and selective constraints collectively influence POWV evolution. Together, our data provide a mechanistic explanation for the slow, long-term evolutionary trends of POWV, and suggest that all arthropod-borne viruses encounter similar selective pressures at the molecular level (i.e. RNAi), yet evolve much differently due to their unique rates and modes of transmission.

Ward, J.S., **S.C. Williams**, **M.A. Linske**. 2016. Independent effects of invasive shrubs and deer herbivory on plant community dynamics. *Forests* 8(2) 1-18. doi:10.3390/f8010002

Abstract. Both invasive species and deer herbivory are recognized as locally important drivers of plant community dynamics. However, few studies have examined whether their effects are synergistic, additive, or antagonistic. At three study areas in southern New England, we examined the interaction of white-tailed deer (*Odocoileus virginianus* Zimmermann) herbivory and three levels of invasive shrub control over seven growing seasons on the dynamics of nine herbaceous and shrub guilds. Although evidence of synergistic interactions was minimal, the separate effects of invasive shrub control and deer herbivory on plant community composition and dynamics were profound. Plant communities remained relatively unchanged where invasive shrubs were not treated, regardless if deer herbivory was excluded or not. With increasing intensity of invasive shrub control, native shrubs and forbs became more dominant where deer herbivory was excluded, and native graminoids became progressively more dominant where deer herbivory remained severe. While deer exclusion and intensive invasive shrub control increased native shrubs and forbs, it also increased invasive vines. Restoring native plant communities in areas with both established invasive shrub thickets and severe deer browsing will require an integrated management plan to eliminate recalcitrant invasive shrubs, reduce deer browsing intensity, and quickly treat other opportunistic invasive species.

Wu, Bin-yan; Ye, Jian-Ren; Huang, Lin; He, Ling-Min; **Li, De-Wei**. 2017. Validation of reference genes for RT-qPCR analysis in *Burkholderia pyrrocinia* JK-SH007. Journal of Microbiological Methods 132: 95–98. http://dx.doi.org/10.1016/j.mimet.2016.10.004

Abstract. *Burkholderia pyrrocinia* strain JK-SH007 isolated from poplar stems plays a highly significant role in the growth promotion and the biocontrol of poplar canker during colonization in poplar. In this research, the ideal reference gene was filtered and determined for the transcript normalization. Additionally, the expression of *pyrG* under all four conditions was relatively stable in *B. pyrrocinia* JK-SH007.

GRANTS RECEIVED DECEMBER 2016

The Connecticut Agricultural Experiment Station Receives Major Award from the Centers for Disease Control and Prevention for Establishment of a "Northeast Regional Center for Excellence in Vector-Borne Diseases" in partnership with Cornell University, Columbia University, and the New York State Department of Health.

The Center for Vector Biology & Zoonotic Diseases at the Station in collaboration with Cornell University, Columbia University, Fordham University and the New York and Connecticut State Departments of Health, has been awarded a 5 year, $10 million dollar grant from the Centers for Disease Control and Prevention to establish a "Northeast Regional Center for Excellence in Vector-Borne Diseases". This is one of four regional centers in the United States that will address emerging and exotic vector-borne diseases, like Zika. The goals of the Northeast Center will be to (1) develop and evaluate more effective vector-borne disease prevention and control tools and methods necessary to anticipate and respond to disease outbreaks, (2) train a cadre of public health entomologists with the knowledge and skills required to rapidly detect, prevent and respond to vector-borne disease threats in the United States, and (3) build effective collaborations between academic communities and public health organizations at federal, state, and local levels for vector-borne disease surveillance, response and prevention. The Center will focus its research efforts on mosquito and tick transmitted diseases of major concern to the region including West Nile virus, eastern equine encephalitis, Lyme disease, babesiosis and Powassan virus, and emerging and exotic vector-borne-diseases such as Zika, dengue, chikungunya and heartland viruses. Scientists will also study the effects of climate change on mosquitoes and ticks currently experiencing range expansion in the northeast in an attempt to better assess and predict current and future human risk of infection with vector borne-pathogens. We are extremely fortunate and delighted to have received this award with Cornell University and our other partners. This funding will be used to expand our current State-supported research and surveillance programs on mosquitoes and ticks and allow our highly skilled multidisciplinary team of scientists to address some of the most pressing issues with new knowledge, and further increase our capacity to respond to current and future threats from vector-borne diseases in the region with appropriate and timely local public health action.

CAES investigators from the Center for Vector Biology & Zoonotic Diseases include: Dr. Theodore Andreadis, director (co-principal investigator); Dr. Philip Armstrong, virologist/medical entomologist; Dr. Douglas Brackney, assistant research scientist; Dr. Goudarz Molaei, associate research scientist; Dr. Kirby Stafford III, chief entomologist and state entomologist; and Dr. Scott Williams, associate research scientist and certified wildlife biologist.

Co-principal investigators from other institutions include: Dr. Laura Harrington, professor and head, Department of Entomology Cornell University; Bryon Backenson, research scientist and deputy director for disease control at the New York State Department of Health; Dr. Laura Kramer, director of the Arbovirus Laboratories at the Wadsworth Center, New York State Department of Health; and Dr. Maria Diuk-Wasser, associate professor of ecology, evolution and environmental biology at Columbia University.

The CDC awarded four $10 million grants. The other recipients were the University of Florida, the University of Texas–Galveston and the University of Wisconsin–Madison, each of which will form their own Vector Borne Disease Regional Centers for Excellence. The funding is part of $184 million awarded by the CDC to states, territories, local jurisdictions and universities to support efforts to fight Zika virus and other vector-borne diseases.

Wu, Bin-yan; Ye, Jian-Ren; Huang, Lin; He, Ling-Min; **Li, De-Wei**. 2017. Validation of reference genes for RT-qPCR analysis in *Burkholderia pyrrocinia* JK-SH007. Journal of Microbiological Methods 132: 95–98. http://dx.doi.org/10.1016/j.mimet.2016.10.004

Abstract. *Burkholderia pyrrocinia* strain JK-SH007 isolated from poplar stems plays a highly significant role in the growth promotion and the biocontrol of poplar canker during colonization in poplar. In this research, the ideal reference gene was filtered and determined for the transcript normalization. Additionally, the expression of *pyrG* under all four conditions was relatively stable in *B. pyrrocinia* JK-SH007.

JOURNAL ARTICLES APPROVED DECEMBER 2016

Deng, R., D. Lin, L. Zhu, **Sanghamitra Majumdar**, **Jason C. White**, J. L. Gardea-Torresdey, and B. Xing. Nanoparticle interactions with co-existing contaminants: toxicity, bioaccumulation and risk. *Nanotoxicology*

LaMondia, James A. and **Katja Maurer**. Evaluation of fungicides for management of box-wood blight, 2016. *Plant Disease Management Reports*

Lehner, Bryan W., **Neil P. Schultes,** and **Douglas W. Dingman.** Comparative analysis of enolase in different *Paenibacillus larvae* subspecies. *Journal of Invertebrate Pathology*

Li, De-Wei, J. Y. Chen, and Y. X. Wang. *Wiesneriomyces machilicola*, a new species of hyphomycetes from China. *Mycotaxon*

Li, J., H. Sang, H. Guo, G. Jung, A. Mukherjee, **Jason C. White**, and B. Xing. Antifungal mechanisms of ZnO and Ag nanoparticles to *Sclerotinia homeocarpa*. *Agriculture, Ecosystems and Environment*

Li, Yonghao. Needle cast diseases of spruce. *CAES Fact Sheet*

Lin, C. G., E. H. C. McKenzie, D. J. Bhat, S. F. Ran, Y. Chen, K. D. Hyde, **De-Wei Li**, and Y. Wang. Stachybotrys-like taxa from karst areas and a checklist of Stachybotrys-like species from Thailand. *Mycosphere*

Maier, Chris T. First detection and distribution of the brown marmorated stink bug, *Halyomorpha halys* (Stål) (Hemiptera: Pentatomidae), in Connecticut based mainly on reports of citizens between 2008 and 2015. *Proceedings of the Entomological Society of Washington*

Shidore, Teja and **Lindsay Triplett**. Toxin-antitoxin systems: implications for plant disease. *Annual Review of Phytopathology*

Wang, Q. H., C. H. Duan, X. H. Liu, **De-Wei Li**, S. G. Niu, L. Q. Hou, and X. Q. Wu. First report of walnut anthracnose caused by *Colletotrichum fructicola* in China. *Plant Disease*

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STATION NEWS

Historic First Article in *Phytobiomes* Journal Now Available, Open Access

Carolyn Young (*Phytobiomes* editor-in-chief), **Linda Kinkel** (*Phytobiomes* associate editor-in-chief), the *Phytobiomes* Editorial Board, and the APS Publications Board are proud to introduce the first article published in *Phytobiomes*. This groundbreaking paper, "Response of Sediment Bacterial Communities to Sudden Vegetation Dieback in a Coastal Wetland," was written by **Wade H. Elmer**, **Peter Thiel**, and **Blaire Steven** of the Connecticut Agricultural Experiment Station in New Haven. The unlikely setting for this research article takes place in the marshes of Connecticut's Hammonasset Beach State Park in Madison, CT. These marshes, which produce large amounts of plant biomass, have been beneficial to Connecticut's coastal ecosystems by providing protection from erosion, habitats for native birds and fish, and absorption of fertilizer runoff. Recently and with no clear cause, however, this marsh and others on the Atlantic coast have been severely affected by sudden vegetation dieback (SVD). The issue: a rapid death of the dominant marshgrass *Spartina alterniflora.* In this paper, Elmer and colleagues investigated the effects of SVD on soil carbon flux and microbial composition. They found SVD was associated with a substantial reduction in Bacteroidetes-related bacteria and an enrichment of sulfate-reducing bacteria. The results reported in the article suggest that Bacteriodetes play a significant role in processing the carbon fixed by *S. alterniflora* in wetlands, which serve as important sinks of atmospheric carbon. "True to *Phytobiomes*' transdisciplinary scope, the article covers nutrients, ecology, microbiomes, and climate change," said Young. "Through this journal, we seek to build a distinct scope and way of thinking about plant systems by actively integrating diverse factors that interact to mediate plant productivity, and this article is an excellent example of this."

View this open-access article at apsjournals.apsnet.org/doi/full/10.1094/PBIOMES- 09-16-0006-R.

Visit www.phytobiomesjournal.org *to learn more about the scope, intended readership, manuscript types, discounted page charges, and more. Questions about submitting to the* Phytobiomes *journal? Contact Young at* PhytobiomesEIC@scisoc.org.

Authors Wade Elmer, Peter Thiel, and Blaire Steven of the first published article in the new Phytobiomes *journal.*

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The Connecticut Agricultural Experiment Station

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The Connecticut Agricultural Experiment Station

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

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

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

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

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

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