Station News

The Connecticut Agricultural Experiment Station
Volume 6 Issue 1 January 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

This Issue

ADMINISTRATION

DR. THEODORE ANDREADIS presented an overview of the Experiment Station and its various research, regulatory and public service programs at a meeting of the Connecticut State Consulting Committee for Agricultural Science and Technology Education held at the Sation (December 2); and presented an talk entitled, *Spatial-Temporal Patterns of Mosquito-Borne Bunyaviruses in Connecticut,* at the 61th Annual Meeting of the Northeastern Mosquito Control Association held in Cambridge, MA (200 attendees) (December 8).

ANALYTICAL CHEMISTRY

DR. JASON C. WHITE attended the 2nd Annual Parma Nanotechnology Conference at the University of Parma in Parma Italy and presented a lecture entitled "Nanotechnology and Agriculture in the United States" (75 attendees) as part of a Round-table discussion and a lecture entitled "Nanotechnology and the Environment: Applications and Implications" (100 attendees) (December 1-5); joined the Dissertation Committee of Ms. Illya Aidee Medina Velo of the University of Texas-El Paso Department of Chemistry (December 6); presented an invited lecture at the University of Connecticut Department of Chemistry Seminar series entitled "The Pros and Cons of Nanomaterial Interactions with Crops" (30 attendees) (December 7); along with **DR. BRIAN EITZER, DR. CHRISTINA ROBB AND DR. WALTER KROL** met with staff of the University of Connecticut Center for Environmental Science and Engineering (CESE) (3 attendees) (December 7); along with**, DR. BRIAN EITZER, MR. MICHAEL CAVADINI, MR. JOSEPH HAWTHORNE, MR. CRAIG MUSANTE, DR. CHRISTINA ROBB AND MS. TERRI ARSENAULT** participated in the monthly FDA FERN cCAP teleconference call (December 10); participated in the Northeast Regional Association of State Agricultural Experiment Station Directors teleconference call (December 15); participated in a teleconference call with colleagues at Texas A&M University and Washington State University to discuss collaborative experiments on graphene nanomaterials (December 15); along with Dr. Luca Pagano participated in a Skype call with researchers at the Centre de Recherche et d'Enseignement de Géosciences de l'Environnement (CEREGE) in Aix en Provence, France to discuss collaborative experiments on the molecular effects of nanomaterial exposure (2 attendees) (December 16); along with **DR. WALTER KROL** participated in a teleconference call with CT DEEP and UConn CESE to discuss ongoing analysis of lobster tissue for synthetic pyrethroids (8 attendees) (December 21, 29); and participated in a teleconference call for the Water and Nanotechnology Working Group of the Association of Public Health Laboratories (8 attendees) (December 22).

DR. BRIAN EITZER was a participant in the NACRW teleconference call (December 11).

DR. CHRISTINA ROBB attended the Eastern Analytical Symposium general board meeting (December 11) and a program meeting (December 21).

ENTOMOLOGY

DR. KIRBY C. STAFFORD III provided a departmental overview to members of the Connecticut State Consulting Committee for Agricultural Science and Technology Education (6 attendees) (December 2); participated in a meeting of the Connecticut Coalition Against Bed Bugs at the Station (December 2); presented an update on tick management at the meeting of the Northeast Mosquito Control Association in Newport, RI (December 8); participated in a tick IPM working group conference call (December 9); interviewed by free-lance writer Andrew Barton about tick control research (December 10); participated on a USDA ICS exercise planning conference call (December 21); and participated on a tick IPM symposium planning committee conference call (December 21).

DR. CHRIS T. MAIER discussed the brown marmorated stink bug and the spotted wing drosophila with fruit growers while attending the Annual Meeting of the Connecticut Pomological Society in Glastonbury (December 1).

DR. GALE E. RIDGE did a collaborative presentation about bed bug biology, behavior, and management with Dr. Richard Cowles to the environmental health staff of Yale University, New Haven (40 attendees) (December 9); and spoke to health directors/staffs and transfer station personnel in western Connecticut (Brookfield town hall) about bed bugs in the third of a series of training talks for mattress recyclers in the state (December 10).

DR. CLAIRE E. RUTLEDGE met with the Wallingford, CT Conservation Board to discuss emerald ash borer mitigation options in Tyler Mill Conservation Area and the town (10 attendees) (December 10).

DR. KIMBERLY A. STONER spoke at the 12th District Environmental Planning Summit, held by State Senator Ted Kennedy, Jr. as a member of the panel on Reducing Pesticide Use and Ensuring Pollinator Health (60 attendees) (December 3); spoke at New England Grows on "Keeping Bees Healthy", Boston, MA (500 attendees, 50 at the Q&A afterward) (December 4); met with Katherine Blake and Corrie Folsom-O'Keefe of Audubon CT about biodiversity studies on Urban Oases in New Haven, and how the Experiment Station might cooperate with Audubon CT and Common Ground School in identifying insects collected in these studies. (December 11); facilitated a Farmer-to-Farmer Session at the New England Vegetable and Fruit Conference on Pollinator Protection, Manchester, NH (35 attendees) (December 15); and spoke on "Pollination of Pumpkin and Winter Squash – Thanks to Bumble Bees!" at the New England Vegetable and Fruit Conference in Manchester, NH and also invited the speakers, organized and moderated the session on Cucurbit Vine Crops (200 attendees) (December 16).

ENVIRONMENTAL SCIENCES

DR. PHILIP ARMSTRONG gave the talk "Phylogeography of Mosquito-Borne Bunyaviruses in the Northeastern U.S." at the Northeastern Mosquito Control Association, Newport, RI (180 attendees) (December 7).

MR. GREGORY BUGBEE participated as a member of the 2016 CTDEEP aquatic invasive species grants review team at CTDEEP headquarters in Hartford (December 3).

DR. GOUDARZ MOLAEI hosted the State of Connecticut Consulting Committee for Agricultural Science and Technology Education and discussed CAES research initiatives and services on ticks and tick-associated diseases (8 attendees) (December 2); and gave an invited talk, "Ticking for a Quarter of a Century: Spatiotemporal Distribution of Infection in Ixodes scapularis Ticks Questing Human Hosts in Connecticut, 1996-2015", at the Annual Meeting of the Northeastern Mosquito Control Association (approximately 8 attendees) (December 8).

MR. JOHN SHEPARD gave the talk "Arbovirus Activity in Connecticut, 2015" at the 61st Annual Meeting of the Northeastern Mosquito Control Association in Newport, RI (approx. 180 attendees) (December 7-9).

FORESTRY AND HORTICULTURE

DR. JEFFREY WARD interviewed about roadside forest management by Bob Miller of the Danbury News-Times (December 1); interviewed about effect of warm weather on trees flowering by Nelson Oliveira of the Danbury News-Times (December 3); interviewed about effect of warm weather on trees by Kevin Arnone of WTNH News8 (December 7); spoke on "Roadside forests: management solutions for storm resilience, a "Stormwise" approach" for a CLEAR webinar (56 attendees) (December 8); participated in a New England Society of American Foresters planning meeting (December 15); along with DR. ADRIANA ARANGO, administered practical and oral examination to arborist candidates for the Connecticut Tree Protection Examining Board (December 16); and interviewed about the effect of warm weather on hemlock health by Nat Lynch of the New London Day (December 24).

DR. ADRIANA ARANGO VELEZ was interviewed by Nate Lynch of the New London Day about the range expansion range of insects, such as southern pine beetle, due to changes in climatic (December 24).

DR. ABIGAIL MAYNARD attended the annual meeting of the Connecticut Pomological Society in Glastonbury (December 1); spoke about the New Crops Program to members of the State Consulting Committee for Agricultural Science and Technology Education (10 adults) (December 2); and gave a talk “Calabaza Squash and Personal-sized Watermelons – Two High Valued Specialty Crops” at the New England Vegetable and Small Fruit Conference in Manchester, NH (180 adults) (December 16).

DR. SCOTT WILLIAMS with **MR. MICHAEL SHORT** and **MS. MEGAN LINSKE** consulted with Town of Guilford Environmental Planner Kevin Magee on the location of deer exclosures in the Town's East River Preserve in Guilford (December 7); with **MR. MICHAEL SHORT** and **MS. MEGAN LINSKE** met with staff at Bobbex, Inc. to explain the results of an experimental animal repellent trial in Monroe (December 8); gave an invited talk to graduate students in the Department of Natural Resources and the Environment at the University of Connecticut about non-academic employment opportunities (8 students) (December 9); and participated in the quarterly meeting of the Executive Board of the Connecticut Urban Forest Council in Middlefield (December 11).

MR. JOSEPH P. BARSKY hosted the quarterly meeting of the Connecticut State Consulting Committee for Agricultural Science and Technology Education at CAES (6 attendees) (December 2); participated in the New England Society of American Foresters quarterly meeting teleconference (December 9).

PLANT PATHOLOGY AND ECOLOGY

DR. WADE H. ELMER Met with members of the Connecticut State Consulting committee for Agricultural Sciences and Technology in JW conference room and presented information on his program (5 adult attendees) (December 2).

DR. FRANCIS FERRANDINO attended the New England Fruit and Vegetable Conference held in Manchester, NH and delivered a talk entitled "The Effect of Vine Architecture in New England Vineyards" (72 adult attendees) (December 15-17).

DR. ROBERT MARRA Met with members of the Connecticut State Consulting committee for Agricultural Sciences and Technology in JW conference room and presented information on his program (5 adult attendees) (December 2).

DR. QUAN ZENG delivered a guest lecture and a lab session at the University of Connecticut, Storrs on common bacterial pathogens, diseases, and pathogenicity factors along with a laboratory practice using a multiplex PCR detection of bacterial pathogens (17 students) (December 9).

VALLEY LABORATORY

DR. JATINDER AULAKH discussed Mugwort research trials selected sites with Erin o' Hare, Environment and Natural Resources Planner, Wallingford, CT (December 8); and attended "Diversity" training in Hartford (December 16).

DR. CAROLE CHEAH was interviewed by Nate Lynch of the Day of New London about warm temperatures and effects on hemlock woolly adelgid (December 24).

DR. RICHARD COWLES presented "Control measures for bed bugs" to facilities managers for Yale University, New Haven (25 attendees) (December 9).

MS. ROSE HISKES participated in the Pesticide Resistance Management Education Webinars put on by the Northeastern Integrated Pest Management Center (December 3, 7, 10, 14); participated in the Connecticut Invasive Plant Working Group Symposium Planning Committee meeting in Windsor (December 8); and met with the Friends of Bolton Lakes Association board to discuss educational materials for waterfront property owners in Connecticut (December 16).

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 (December 16).

DEPARTMENTAL RESEARCH UPDATES DEC. 2015

Majumdar, S.; Trujillo-Reyes, J.; Hernandez-Vieczas, J.; **White, J.C.**; Peralta-Videa, J.; Gardea-Torresdey, J. 2016. Cerium biomagnification in a terrestrial food chain: Influence of particle size and growth stage. Environ. Sci. Technol. 10.1021/acs.est.5b04784.

ABSTRACT: Mass-flow modelling of engineered nanomaterials (ENMs) indicates that a major fraction of released particles partition into soils and sediments. This has aggravated the risk of contaminating agricultural fields, potentially threatening associated food webs. To assess possible ENM trophic transfer, cerium accumulation from cerium oxide nanoparticles (nano-CeO_2) and their bulk equivalent (bulk-CeO_2) was investigated in producers and consumers from a terrestrial food chain. Kidney bean plants (*Phaseolus vulgaris* var. red hawk) grown in soil contaminated with 1000 - 2000 mg/kg nano-CeO_2 or 1000 mg/kg bulk-CeO_2 were presented to Mexican bean beetles (*Epilachna varivestis*), which were then consumed by spined soldier bugs (*Podisus maculiventris*). Cerium accumulation in the plant tissues was independent of CeO_2 particle size. However, the beetle larvae feeding on nano-CeO_2 exposed leaves accumulated low levels of Ce since ~98% of Ce was excreted, in contrast to bulk-CeO_2. Ce accumulation in plant and consumer tissues were independent of particle size at similar exposure concentration. Particle-size and exposure duration dependent biomagnification was observed from plants to adult beetles and further to spined soldier bugs. The risk associated with this food chain exposure is unknown but is the topic of ongoing investigation.

Brown, H. E., Young, A., Lega, J., **Andreadis, T. G.,** Sturich J., and Comrie, A. 2015. Projection of climate change influences on U. S. West Nile virus vectors. *Earth Interactions* 19:(18) 1-18.

ABSTRACT: While estimates of the impact of climate change on health are necessary for health care planners and climate change policy makers, models to produce quantitative estimates remain scarce. This study describes a freely available dynamic simulation model parameterized for three West Nile virus vectors, which provides an effective tool for studying vectorborne disease risk due to climate change. The Dynamic Mosquito Simulation Model is parameterized with species-specific temperature-dependent development and mortality rates. Using downscaled daily weather data, this study estimates mosquito population dynamics under current and projected future climate scenarios for multiple locations across the country. Trends in mosquito abundance were variable by location; however, an extension of the vector activity periods, and by extension disease risk, was almost uniformly observed. Importantly, midsummer decreases in abundance may be offset by shorter extrinsic incubation periods, resulting in a greater proportion of infective mosquitoes. Quantitative descriptions of the effect of temperature on the virus and mosquito are critical to developing models of future disease risk.

Nelson R, Esponda-Morrison B, **Armstrong P**, **Shepard J** (2015) West Nile virus- Connecticut, 2015. *Connecticut Epidemiologist* 35(7): 25-26.

ABSTRACT: This report describes West Nile virus (WNV) activity in Connecticut during 2015. Human cases of WNV associated illnesses and WNV positive mosquitoes indicated heightened transmission in southern Connecticut and a focal area of increased human risk in the town Bridgeport. Of the 10 WNV case-patients reported in Connecticut, 6 (60%) were residents of Bridgeport with onset of illness August 9-September 24. The 6 Bridgeport residents identified with WNV-associated illnesses during 2015 is the most in a single season for any city in Connecticut since WNV was first identified in 1999.

DR. JATINDER AULAKH produced a factsheet titled "Horsenettle (*Solanum carolinense* L.)-Identification and Management in Connecticut Pastures and Rangelands"

JOURNAL ARTICLES APPROVED DEC. 2015

Arango-Velez, A. Southern pine beetle in Northeastern U.S. *CAES Fact Sheet*

Aulakh, J. S. Horsenettle (*Solanum carolinense* L.) – Identification and management in Connecticut pastures and rangelands. *CAES Fact Sheet*

Holden, P. A., **J. C. White** et al. (35 authors). Considerations of environmentally-relevant test conditions for improved evaluation of ecological hazards of engineered nanomaterials. *Environmental Science and Technology*

Li, De-Wei (Editor). *Biology of Microfungi*. Springer.

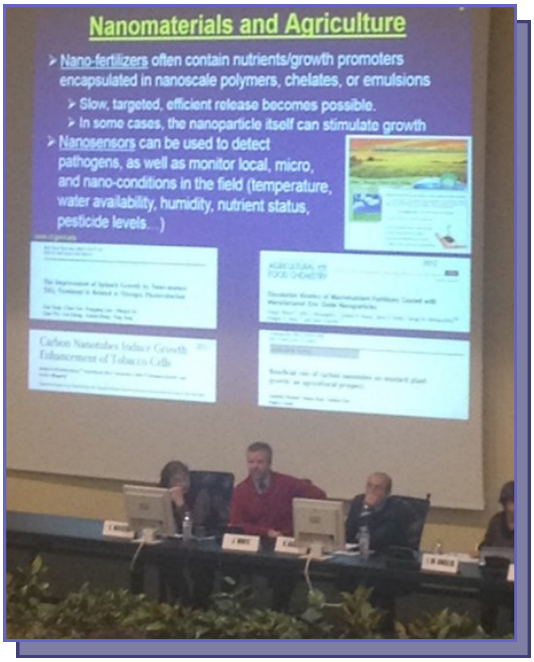
Linske, M. A., S. C. Williams, J. S. Ward, and I. M. Ortega. Trophic cascade effects of white-tailed deer overabundance on Connecticut's native vegetation and small mammal populations: theory and management. *Northeastern Naturalist*

Ma, X., Q. Wang, L. Rossi, S. Ebbs, and **J. C. White**. Multigenerational exposure to cerium oxide nanoparticles: physiological and biochemical analysis reveals transmissible changes in rapid cycling *Brassica rapa*. *NanoImpact*

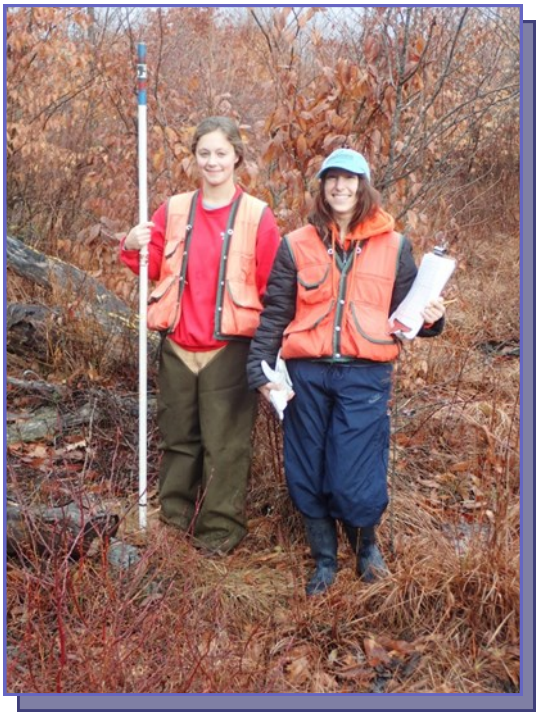
Ridge, G. E. and A. Bharadwaj. The efficacy of *Metarhizium anisopliae* (Hypocreales: Clavicipitaceae), Strain F52 against the bed bug *Cimex lectularius* L. (Heteroptera: Cimicidae) in the laboratory. *Journal of Economic Entomology*

Triplett, L. and J. Leach. Host resistance to TAL effectors: thinking outside the UPT box. *Proceedings of the 11th US-Japan Scientific Seminar on Plant-Microbe Interactions*

ARTICLES OF INTEREST DEC. 2015



Dr. Jason C. White speaking at the 2nd Annual Parma Nanotechnology Conference at the University of Parma, Parma, Italy



Amanda Massa and **Jamie Cantoni** are returning for another season of field work in the Department of Forestry and Horticulture

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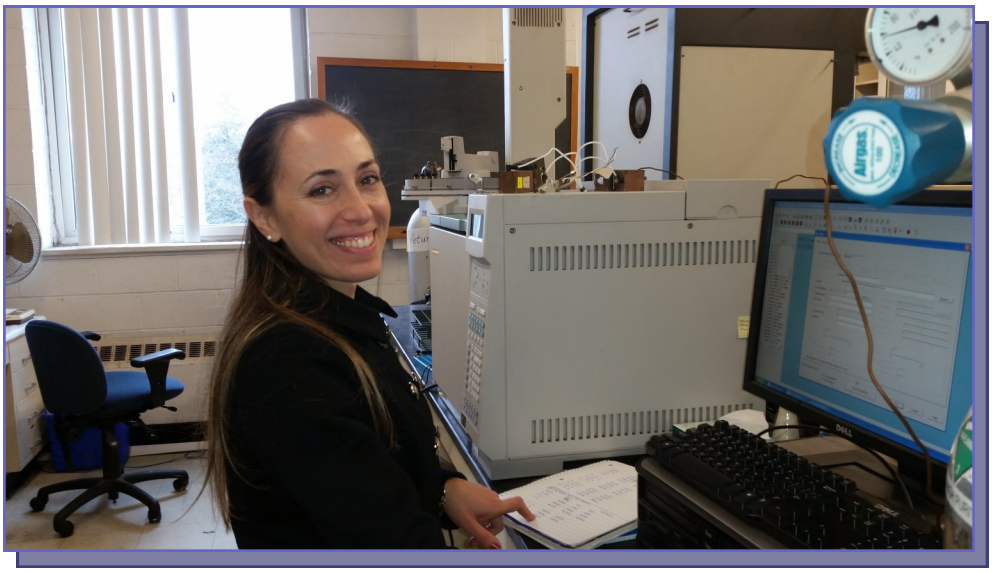
STATION NEWS

Congratulations to **Dr. Yonghao Li** who was granted U.S. citizenship on December 11, 2015 in the Federal Court in New Haven, CT



MS. MAGALI BAZZANO joined The Department of Plant Pathology and Ecology in Dr. Wade Elmer' s Laboratory in December 2015 as a seasonal worker. Ms. Bazzano had completed her Master's thesis at the University of New Haven under the supervision of Dr. Elmer. She had previously worked in the department of Forestry and Horticulture from September 2015 to November 2015 as a seasonal worker in Dr. Adriana Arango-Velez's laboratory.

Mr. Isaac Buabeng was recently hired as the custodian at the Valley Laboratory. Isaac is originally from Ghana in West Africa, currently lives in Hartford, and is pursuing an Associate's degree in Computer Engineering at Manchester Community College. He is also a contemporary gospel artist who writes his own songs and plays the drums, piano and acoustic guitar.

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Main Laboratories, New Haven

Lockwood Farm, Hamden

Griswold Research Center, Griswold

Valley Laboratory, Windsor

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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

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

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