STATION NEWS

THE CONNECTICUT AGRICULTURAL EXPERIMENT STATION

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PUTTING SCIENCE TO WORK FOR SOCIETY

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.

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Departmental News

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DEPARTMENTAL NEWS

ADMINISTRATION

DR. THEODORE ANDREADIS attended an Invasive Council Meeting in Hartford (December 10); met with Federated Garden Club President, Jacqueline Connell and officers of their board and was presented with a donation to the Experiment Station (December 11); attended a Connecticut Wine Council Meeting in Hartford (December 12); and attended the USDA Aphis Cooperative Agricultural Pest Survey Program state meeting held in Wallingford (December 13).

ANALYTICAL CHEMISTRY

DR. JASON C. WHITE attended the annual NSF Nanoscale Science and Engineering Conference in Arlington VA and presented a poster entitled "Nanomaterial contamination of agricultural crops" and co-presented a poster with Dr. Joseph Pignatello entitled "Nanoscale interactions between engineered nanomaterials and black carbon (biochar) in soil" (December 4-6), participated in a USDA REEport informational webinar (December 12), and along with **MS. KITTIPATH PRAPAYOTIN-RIVEROS, MS. TERRI ARSENAULT, MR. MICHAEL CAVADINI,** and **DR. WALTER KROL** participated in an FDA webinar focused on MFRPS-ISO accreditation sampling agreements (December 18), and was interviewed by the New Haven Register about a recent article on the use of tire crumb rubber in athletic fields (December 27).

DR. BRIAN EITZER participated in the FDA FERN mycotoxin working group conference call on (December 5), gave a talk on the determination of organic contaminants in foods to the Yale Occupational and Environmental Medicine Group on (December 10)(15 people), and participated in conference calls for the North American Chemical Residue Workshop (NACRW) organizing committee (December 12).

DR. CHRISTINA ROBB participated in the FDA FERN mycotoxin working group conference call on (December 5), participated by phone in the Eastern Analytical Symposium (EAS) board meeting (December 6), and represented the Department of Analytical Chemistry at the Connecticut State Public Health Laboratory System Performance Assessment in Rocky Hill CT (December 10).

MR. JOHN RANCIATO, along with MR. CRAIG MUSANTE, assisted a Yale undergraduate student in Ecology and Evolutionary Biology with an anthropology class project testing if fallen leaves used for garden composting for lead content (December 5, 12).

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DR. ALIA SERVIN (pictured below) has joined the Department of Analytical Chemistry as a Post-Doctoral Research Associate. Dr. Servin completed her Ph.D. within the Department of Chemistry at the University of Texas-El Paso; her dissertation was entitled “Effects of TiO2 NPs on *Cucumis sativus* (cucumber).” Dr. Servin will be working on a USDA-funded research project assessing the impact of biochar on the uptake and translocation of engineered nanomaterials within agricultural crops.

ENTOMOLOGY

MS. KATHERINE DUGAS, with **MS. ROSE HISKES**, trapped and collected winter moths in Shelton, Milford, and Mystic; trap catches were sent to Dr. Joe Elkinton, UMASS, for identification (December 11 and 27); and with **MS. ROSE HISKES**, submitted a Forest Pest Outreach Suggestion to USDA for Farm Bill funding consideration (December 30).

DR. LAURA ESTEP HAYES gave a talk titled "A Field Trial to Quantify the Effectiveness of Individual and Integrated Control Measures in Reducing Tick-borne Pathogen Exposure Risk" at the Northeastern Mosquito Control Association Annual Meeting in Hull, MA (100 adult attendees) (December 10); with **DR. KIRBY C. STAFFORD III**, participated in a conference call for the Public Tick Integrated Pest Management Working Group (December 11); with **DRS. KIRBY C. STAFFORD III, SCOTT C. WILLIAMS,** and **GOUDARZ C. MOLAEI**, participated in a conference call with U.S. Biologic to discuss new technologies for control of tick-associated disease (December 17); and with **DRS. KIRBY C. STAFFORD III** and **SCOTT C. WILLIAMS**, attended a meeting in Redding, CT, to discuss with township representatives the objectives and progress of the Integrated Tick Management project currently underway there (December 17).

MS. ROSE HISKES, with **MS. KATHERINE DUGAS**, trapped and collected winter moths in Shelton, Milford, and Mystic; trap catches were sent to Dr. Joe Elkinton, UMASS, for identification (December 11 and 27); with **DR. CLAIRE RUTLEDGE**, staffed a Forest Pest Outreach table at an Emerald Ash Borer Management Workshop of the Connecticut Tree Wardens Association in Rocky Hill (163 attendees) (December 12); organized and ran the Statewide CAPS committee meeting at the USDA offices in Wallingford (16 attendees) (December 13); participated in a regional CAPS state survey coordinator conference call (December 19); with **MS. KATHERINE DUGAS**, submitted a Forest Pest Outreach Suggestion to USDA for Farm Bill funding consideration (December 30); and spoke with Bob Miller of the Danbury News Times about insects and what effects the very cold weather has on them (December 30).

CAES Factsheet:
Hiskes, R. T. 2013. Pigweed Flea Beetle (*Disonycha glabrata*) Coleoptera:Chrysomelidae.

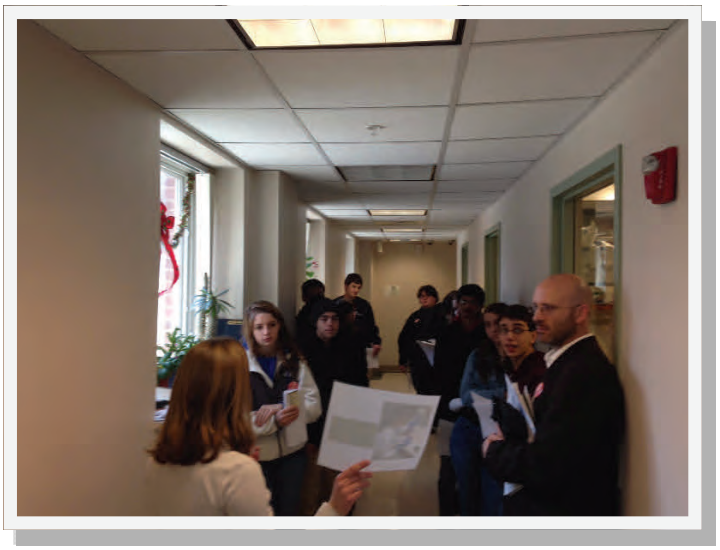
DR. CHRIS T. MAIER presented a display on apple damage caused by stink bugs and spoke about Lou Magnarelli's career and interaction with fruit-growers at the Annual Meeting of the Connecticut Pomological Society in Glastonbury (December 3); and spoke about the brown marmorated stink bug at an advisory committee meeting of the Cooperative Agricultural Pest Survey, Animal Plant Health and Inspection Service, USDA, in Wallingford (December 13).

DR. GALE E. RIDGE trained mattress recyclers and refurbishers at Green Park Recycling in Bridgeport on self-protection against bed bugs (20 attendees) (December 4); was visited by students from the Norwich Free Academy and spoke about bed bug biology and behavior to reduce anxiety and stigma (December 11); and presented a talk about bed bugs and self-protection to the staff at the Miller Library in Hamden (30 attendees) (December 12).

DR. CLAIRE E. RUTLEDGE gave a talk titled "Emerald Ash Borer" to the national meeting of the American Association of Consulting Arborists in Montville (120 adult attendees) (December 5); with **MS. ROSE HISKES**, staffed a Forest Pest Outreach table at an Emerald Ash Borer Management Workshop of the Connecticut Tree Wardens Association in Rocky Hill (163 adult attendees) (December 12); and attended the Statewide CAPS committee meeting at the USDA offices in Wallingford (16 attendees) (December 13).

DR. VICTORIA L. SMITH participated in a National Plant Board Working Group on *Phytophthora ramorum*, to refine details of the upcoming new Federal Order concerning regulation of *P. ramorum*, held at USDA-Federal Grain Inspection Services Offices in Aurora, CO (25 participants) (December 4-6); participated in the Fall meeting of the CT Cooperative Agricultural Pest Survey (CAPS), held at USDA Offices in Wallingford (15 participants) (December 13); participated in a webinar outlining survey plans for 2014, held in the Analytical Chemistry Conference Room (over 100 participants nationwide) (December 18); and participated in a meeting of the Yale Biosafety Committee in New Haven (20 participants) (December 19).

DR. KIRBY C. STAFFORD III participated with **DR. LAURA E. HAYES** in a tick IPM working group conference call (December 11); introduced the Experiment Station and tick research to visiting students and teacher Jason Croteauj from the Norwich Free Academy, and led a tour of tick and mosquito laboratories. Gale Ridge talked about bed bugs, Elizabeth Alves provided a tour of the tick testing laboratory, Philip Armstrong and Michael Thomas reviewed the mosquito program, and Angela Bransfield met with the group outside the BSL-3 laboratory (14 attendees) (December 11); with **DRS. LAURA E. HAYES, SCOTT C. WILLIAMS,** and **GOUDARZ C. MOLAEI**, participated in a conference call with U.S. Biologic to discuss new technologies for control of tick-associated disease (December 17); and with **DRS. SCOTT WILLIAMS** and **LAURA HAYES**, participated in a meeting on the CDC tick IPM project in Redding, CT, with First Selectman Julia Pemberton, Health Officer Douglas Hartline, State Representative John Shaban, Jere Ross from the Redding Conservation Commission, Georgina Scholl, and deer warden Chris Siburn (December 17).



FORESTRY AND HORTICULTURE

DR. JEFFREY WARD meet with Executive Committee of the Connecticut Tree Wardens Association in Glastonbury to discuss past and future CAES research (12 attendees) (December 3); administered practical and oral examination to arborist candidates for the Connecticut Tree Protection Examining Board (December 11); participated in the CT Statewide Vegetation Management Task Force in Middlefield (December 12); gave invited lecture "Influence of disturbance on stand development during deciduous forest succession" at Harvard Forest, Petersham, MA (14 attendees) (December 13); met with Paul Young, Wilton Tree Warden, to discuss roadside forest management (December 20); met with Bruce Lindsay, Westport Tree Warden, to discuss roadside forest management (December 20).

DR. ABIGAIL MAYNARD attended the annual meeting of the Connecticut Pomological Society in Glastonbury (December 3); reported on Station activities at a meeting of the State Technical Committee in Tolland (December 5); described the Experiment Station and the New Crops Program to a 7th grade science class at Hamden Hall Country Day School (15 students, 1 teacher) (December 12).

DR. SCOTT WILLIAMS participated in an Executive Council conference call for the Northeast Section of the Wildlife Society (December 2); remotely lectured via Skype to a New York University Scientific Journalism class about various research projects in the Forestry and Horticulture Department (15 students) (December 5); et with Dr. Morty Ortega and University of Connecticut master's student Megan Floyd to discuss collaborative research (December 20).

MR. JOSEPH P. BARSKY met with Kathy Gibson (Northeast Utilities) and employees of Lewis Tree Company to discuss roadside forest management in Litchfield (9 attendees) (December 20).

ENVIRONMENTAL SCIENCES

DR. JOSEPH J. PIGNATELLO attended and presented a poster at the NSF Nanoscale Science and Engineering Grantees Conference: Future Trends in Nanotechnology and Environment and Nanomanufacturing in Arlington, VA titled "Nanoscale Interactions between Engineered Nanomaterials and Black Carbon (Biochar) in Soil 2013" co-authored by **JASON C. WHITE** and others (December 4-6).

MS. ANGELA BRANSFIELD talked to students from Norwich Free Academy about the virus isolation work done in the Biosafety Level 3 Laboratory (December 11).

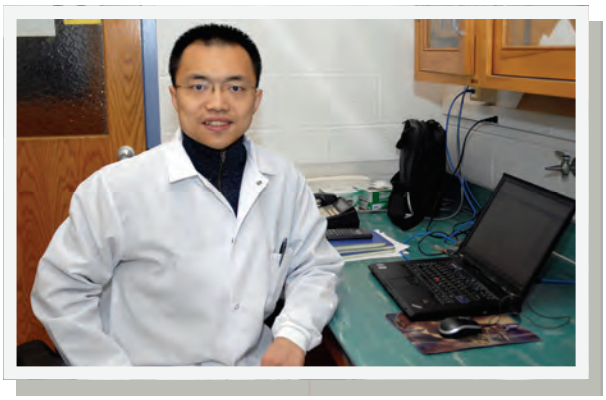
MR. GREGORY BUGBEE with **MS. JORDAN GIBBONS** gave a seminar on "Connecticut Soils and Soil Testing" at the Cooperative Arts and Humanities High School in New Haven (approximately 20 attendees) (December 4); and with **MS. JORDAN GIBBONS** presented a talk entitled "Invasive Plants in Tyler Lake and Dog Pond" at the Goshen Town Office at a meeting organized by State Representative Roberta Willis (approximately 50 attendees) (December 9).

DR. GOUDARZ MOLAEI gave three presentations to the Annual Meeting of the Northeastern Mosquito Control Association in Hull, MA: *i*) Eastern Equine Encephalitis: Knowns and Unknowns" co-authored with **THEODORE ANDREADIS** and others; *ii*) "Host Feeding Patterns of Mosquitoes in A Focus of Eastern Equine Encephalitis Virus in Vermont and Their Roles in Transmission," co-authored by **THEODORE ANDREADIS**, **PHILIP ARMSTRONG** and others; and *iii*) "A Field Trial to Quantify the Effectiveness of Individual and Integrated Control Measures in Reducing Tick-Borne Pathogen Exposure Risk," co-authored by **LAURA HAYES, SCOTT WILLIAMS, AND KIRBY STAFFORD** (December 10).

DR. PHILIP ARMSTRONG and **MICHAEL THOMAS** gave a presentation to a group of high school students from the Norwich Free Academy about the mosquito surveillance program (December 11).

MR. JOHN SHEPARD presented a talk at the 59th Annual Meeting of the Northeastern Mosquito Contol Association in Hull, MA on arbovirus activity in Connecticut, 2013 (approximately 170 meeting attendees) (December 9-11); and was elected to the Board of Directors of the Northeastern Mosquito Control Association.

DR. PENG YI is a colloid (or nanoparticle) and surface science specialist who has expertise in fate and transport of nanoparticles in the environment, interactions between nanoparticles and biological surfaces, and fouling prevention in water-purification membranes. Peng finished his Ph.D. studies in the Department of Geography and Environmental Engineering at Johns Hopkins University in 2013. He obtained his Bachelor and Master degrees in Water Supply and Drainage Engineering at Harbin Institute of Technology, China. At CAES, Peng will work with **DR. JOSEPH PIGNATELLO** and explore the transport behaviors of engineered nanoparticles in soils.



PLANT PATHOLOGY AND ECOLOGY

DR. SHARON M. DOUGLAS was interviewed by Bridgette Ruthman of the Waterbury Republican-American about Phytophthora root rot of conifers and how this disease might impact Connecticut Christmas tree growers and consumers this holiday season (December 9).

DR. WADE H. ELMER participated in a meeting of the State Consulting Committee for Agricultural Science and Technology Education held at the Glastonbury High School AgriScience and Technology Center (8 adults and 7 students attended) (December 4).

DR. FRANCIS J. FERRANDINO, accompanied by CAES Director Andreadis, attended the quarterly meeting of the Connecticut Wine Council held in Hartford (December 12).

DR. YONGHAO LI attended the CT Pomological Society Meeting in Glastonbury (December 3); was interviewed about Phytophthora root rot of Christmas trees by Courtney Zieller of WFSB Channel 3 (December 4).

VALLEY LABORATORY

DR. RICHARD COWLES presented "Spotted wing drosophila: Practical chemical ecology" as the Plant, Soil and Insect Sciences Departmental Seminar at the University of Massachusetts, Amherst, MA, (25 attendees) (December 2); spoke on "Trap improvements, behavioral control challenges and insecticide update," to the CT Pomological Society meeting, Glastonbury (100 attendees) (December 3); participated in an EcoBerry protocol review conference call with Red Tomato (December 10); led a workshop on "Emerald ash borer biology and management," for the CT Municipal Tree Wardens' Association, Rocky Hill (100 attendees) (December 12); presented "SWD IPM: Are we there yet," for a general session on SWD at the New England Vegetable and Berry Growers' Association annual meeting, Manchester, NH, (100 attendees) (December 17); and "SWD in grapes: How much of a problem?" to a viticulture session, (30 attendees) (December 19).

DR. JAMES LAMONDIA met with Marc Cohen, Environmental Planner and Wetlands agent for the Town of Windsor, to discuss CAES research and services (December 10); and examined candidates for the Connecticut arborist license and participated in the quarterly meeting of the Connecticut Tree Protection Examining Board in New Haven (December 11).

DR. TODD L. MERVOSH presented two 1-hour talks on identification, biology and management of invasive plants and on the efficacy and environmental properties of herbicides at a DEEP training program in Wallingford for pesticide applicators with rights-of-way licenses (45 attendees) (December 3).

DEPARTMENTAL RESEARCH UPDATES DECEMBER 2014

Eitzer, B.D.; Hammack, W.; Filigenzi. 2013. Interlaboratory Comparison of a General Method To Screen Foods for Pesticides Using QuEChERS Extraction with High Performance Liquid Chromatography and High Resolution Mass Spectrometry. *J. Agric. Food Chem*. DOI: 10.1021/jf405128y.

ABSTRACT: An interlaboratory comparison of a multipesticide residue analytical method is reported. The goal of the comparison was to evaluate the potential for liquid chromatography/high resolution mass spectrometry along with a specific automated screening procedure to allow the determination of the presence or absence of a set of targeted compounds without additional manual review. The method utilized an off the shelf QuEChERS based extraction followed by analysis with an orbitrap mass spectrometer with the data evaluated by ToxID. The method was tested at three laboratories, with three produce matrices (spinach, carrots, and oranges), and three levels of spiked pesticides with all analyses in triplicate. A series of 247 compounds were tested, and it was found that the three laboratories produced consistent data; however, manual review was still necessary. The data was shown to have no false negatives for 211 compounds in the three produce matrixes at 200 ppb. Of these 211 compounds, 189 had no false negatives at 50 ppb, and 129 had no false negatives at 10 ppb. The HRMS method was shown to be robust with similar data being achieved by all three laboratories and detectable concentrations only slightly above the range shown for triple quadrupole MS/MS.

LaMondia, J. A. 2014. Fungicide efficacy against *Calonectria pseudonaviculata*, causal agent of boxwood blight. *Plant Disease* 98 :99-102.

Calonectria pseudonaviculata is the fungal pathogen that causes leaf spot and stem lesions resulting in defoliation and dieback of boxwood. Fungicides representing twenty different active ingredients from 13 different FRAC groups were evaluated for their effects on conidial germination and mycelial growth using *in vitro* assays and EC_{85} (85% suppression) values were determined. A number of fungicides strongly inhibited mycelial growth of *C. pseudonaviculata*. Four demethylation inhibitor fungicides had EC_{85} values of 1.2 µg ai/ml or less. Thiophanate-methyl, fludioxonil, pyraclostrobin, trifloxystrobin, kresoxim-methyl, mancozeb and chlorothalonil also had activity against mycelial growth. Fludioxonil plus cyprodinil had a lower EC_{85} than the same rate of fludioxonil alone, suggesting that cyprodinil had activity against mycelial growth. Fungicides that inhibited *C. pseudonaviculata* conidial germination include pyraclostrobin, trifloxystrobin and kresoxim-methyl as well as fludioxonil, mancozeb, chlorothalonil and boscalid. Quinoxyfen, etridiazole, fenhexamid, hymexazol, famoxadone and cymoxanil did not inhibit either *C. pseudonaviculata* conidial germination or mycelial growth. In comparison to values found in the literature, EC_{50} values for kresoxim-methyl were up to 10 times higher than reported previously, suggesting that fungicide insensitivity may have developed. Protectant fungicides with activity against conidial germination and systemic fungicides with activity against mycelial growth, such as those identified here, may be complementary to achieve the high levels of pathogen management required for control of this disease. In addition, multiple fungicide active ingredients from different mode of action groups used in mixtures or over time may also act to slow selection for fungicide insensitivity.

Li, De-Wei, Zhao Guihua, Yang C., Ariunaa Jalsrai, Kerin B. 2013. Four note-worthy hyphomycetes from indoor environments. *Mycotaxon* 125:111-121.

Four interesting hyphomycetes (*Nalanthamala vermoesenii*, *Parascedosporium putredinis*, *Stachybotrys elegans*, *Triadelphia australiensis*) have been collected from indoor fungal investigations. Among these fungi, *Triadelphia australiensis* represents a new record for Canada and the USA. *Parascedosporium putredinis* and *Stachybotrys elegans* are reported for the first time from indoor environments.

Ward, J.S. 2013. Precommercial crop tree release increases upper canopy persistence and diameter growth of oak saplings: 23-year results. *Northern Journal of Applied Forestry* 30:156-163.

Abstract.—The effects of precommercial crop tree release (CTR) on growth and stem quality of red oaks (7–22 years old) were examined on seven study areas established in Connecticut in 1988. The three treatments were uncut control, trees given one crown-touching release, and trees released a second time 5 years after the initial release. Diameters and crown classes were measured annually. Heights were measured in 1988 –1994, 2001, and 2012. Bole quality measurements were completed in 1989 and 2011. CTR of oak saplings increased upper canopy persistence (remaining in dominant or codominant crown class) and diameter growth with no loss of height growth or increased number of branches on the lower bole. Upper canopy persistence of codominant oaks was 80% compared with 50% for untreated stems. Trees released twice had diameters 1.5 in. greater than unreleased trees with no increased taper. Heights 24 years after release did not differ among treatments. The presence and number of branches on the lower bole did not differ among treatments in 2011. Precommercial crop tree release provides a management tool to (1) increase the number of oaks that will form part of the mature forest in sapling stands that have few oaks or (2) focus growth on oaks with quality stems in sapling stands with abundant oak.

JOURNAL ARTICLES APPROVED DECEMBER 2013

Hamdi, H., **De La Torre-Roche, R., Hawthorne, J., White, J.C.** Impact of nonfunctionalized and amino-functionalized multi wall carbon nanotubes on pesticide uptake by lettuce. *Environment International*

Clark, Stacy L., Schlarbaum, Scott E., Pinchot, Cornelia C., **Anagnostakis, Sandra L., et al.** American Chestnut Restoration in the National Forest System. *Forest Science*

Rutledge, Claire E., Silk, Peter J., Mayo, Peter Use contact chemical cues in prey discrimination by *Cerceris fumipennis* (Hymenotera crabronidae). *Entomologia Experimentalis et Applicata*

Bai, Y., Wu, F., **White, J.C**., Xing, B., 100 nanometers: An inappropriate threshold for nano environmental impacts. *Environmental Science and Technology*

Beltran, Jose, Teixidó, Marc, **Pignatello, Joesph J**., ISOT Calc, a versatile tool for parameter estimation in sorption isotherms. *Environmental Modelling & Software*

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Main Laboratories, New Haven

Lockwood Farm, Hamden

Griswold Research Center, Griswold

Valley Laboratory, Windsor

THE CONNECTICUT AGRICULTURAL EXPERIMENT STATION

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