Station News

The Connecticut Agricultural Experiment Station
Volume 8 Issue 7 July 2018

The mission of The Connecticut Agricultural Experiment Station is to develop, advance, and disseminate scientific knowledge, improve agricultural productivity and environmental quality, protect plants, and enhance human health and well-being through research for the benefit of Connecticut residents and the nation. Seeking solutions across a variety of disciplines for the benefit of urban, suburban, and rural communities, Station scientists remain committed to "Putting Science to Work for Society", a motto as relevant today as it was at our founding in 1875.

CAES

The Connecticut Agricultural Experiment Station

Putting Science to Work for Society since 1875

This Issue

ADMINISTRATION

DR. THEODORE ANDREADIS participated in the joint summer meeting of the Northeastern Regional Association of State Agricultural Experiment Station and Extension Directors held in Bethany Beach, DE (June 4-7); presented welcoming remarks and an overview of the Experiment Station and its various research, regulatory and public service programs to a group of students from Central Connecticut State University (12 attendees) (June 20); was interviewed about mosquito control and personal protection by Sam Kantrow, WTNH TV 8- (June 25); was interviewed about the CAES tick testing program and increased prevalence of *Borrelia burgdorferi*, the agent of Lyme disease in tick specimens submitted by state residents by Greg Hladky, Hartford Corant (June 25); presented an update on CAES activities at a Board Meeting of the Experiment Station Associates held at the Station (June 27); and was interviewed about the current status of mosquitoes, ticks and associated vector-borne diseases in the state and the research and surveillance activities of the Station's Center for Vector Biology & Zoonotic Diseases by Steve Kotchko, Connecticut Radio Network (June 28).

ANALYTICAL CHEMISTRY

DR. JASON C. WHITE along with **TERRI ARSENAULT, JOHN RANCIATO and MS. KITTY PRAPAYOTIN-RIVEROS** met with representatives of the CT Department of Agriculture regarding the joint ISO Accredited animal feed testing program (AFRPS) (June 1); had a Zoom call with Ms. Jaya Borgatta and Professor Robert Hamers of the University of Wisconsin regarding Jaya's Ph.D. research (I am a committee member); attended the Nanoscale Science and Engineering for Agriculture and Food Systems Gordon Research Conference at Mt. Holyoke College and gave a plenary presentation entitled "Applications versus implications for safe implementation of nanotechnology in food and agriculture" (145 attendees) and gave a poster presentation entitled "Nanoscale elements suppress plant disease, enhance macronutrient use efficiency, and increase crop yield" as part of the annual USDA NIFA Project Investigators meeting (June 3-8); attended the Laboratory Preparedness Advisory Group monthly meeting at the CT DPH Laboratory in Rocky Hill (June 4); met with collaborators from Carnegie Mellon University, the University of California at Santa Barbara, the University of Texas El Paso and Harvard University regarding joint USDA grant proposals (June 6); participated in a senior investigator Zoom call for the Center for Sustainable Nanotechnology (June 8); along with **DR. WADE ELMER** attended a strategic planning meeting for the Center for Sustainable Nanotechnology at the University of Minnesota (June 11-12); along with **MS. TERRI ARSENAULT** participated in a WebEx with officials from FDA regarding performance in the AFRPS (June 14); along with **MR. CRAIG MUSANTE**, **DR. BRIAN EITZER, MS. TERRI ARSENAULT, DR. WALTER KROL,** and **MR. JOHN RANCIATO** participated in the monthly FDA cCAP WebEx (June 14); participated in a teleconference with representatives from Taylor and Francis regarding new privacy legislation in the EU (June 15); hosted Professor Om Parkash and Ms. Ayousha Shahi (graduate student) of the University of Massachusetts (I am on Ayousha's Ph.D. committee) (June 15); met with Mr. Ray Primini of the CT DAS Worker's Compensation unit regarding the CAES Safety Committee (June 15); spoke by phone with Professor Jason Unrine of the University of Kentucky regarding a jointly co-edited special issue of *Environmental Chemistry* (June 19); participated in a Zoom call with Ms. Meghan Cahill of the University of Minnesota regarding a joint research project in the Center for Sustainable Nanotechnology (June 20); attended a planning meeting at Harvard University regarding an upcoming USDA grant submission (June 20-21); hosted a "nano-agriculture" Zoom call as part of the

Center for Sustainable Nanotechnology (12 attendees) (June 25); and participated in a 50-states FDA FERN WebEx (June 28).

DR. CHRISTINA ROBB performed science experiments with the first grade students from John Trumbull Primary School (June 18).

DR. BRIAN EITZER was a participant in the conference call of the North American Chemical Residue Workshop's organizing committee (June 14).

KITTY PRAPAYOTIN-RIVEROS attended the 2018 APHL (Association of Public Health Laboratories) Annual Meeting and Twelfth Government Environmental Laboratory Conference in Pasadena, California and gave a presentation on the ISO Lab Mentorship Program – Mentor/Mentee Collaboration and experiences (approx. 100 attendees); and participated in a workshop on the development of the Laboratory Flexible Funding Model (LFFM) on the behalf of **DR. JASON C. WHITE** during invitation APHL lunch-session for laboratories who are funded through FDA cooperative agreement programs (ISO CAP) (June 3 - 5).

ENTOMOLOGY

DR. KIRBY C. STAFFORD III was interviewed by Sam Kantrow, WTNH, about gypsy moth (June 11); interviewed by Gregory Hladky, Hartford Courant, about the National Honey Bee Survey (June 12); visited by Dr. John-Paul Lavik, Yale Pathology and Laboratory Medicine, to learn about surveillance for vector-borne diseases (June 13); participated in a meeting of the CAPS committee in Jones Auditorium and a meeting on Spotted Lanternfly Outreach and Response (12 participants) (June 14); and was interviewed by Michele Debczak for Mentalfloss.com (June 18).

MS. KATHERINE DUGAS organized and ran the State CAPS Committee meeting held in Jones Auditorium (15 participants) (June 14); and attended the Spotted Lanternfly Outreach and Response Meeting (June 14).

DR. CHRIS T. MAIER spoke about the spotted lanternfly at a meeting of the Connecticut Pomological Society held at Bishop's Orchard, Guilford (70 attendees) (June 13).

DR. GALE E. RIDGE was interviewed by Erika Engelhaupt about Delusionary Infestations for the National Geographic Magazine (June 6); was interviewed by Harold Levi from the Journal-Inquirer about tomato pests (June 11); was interviewed about the Asian Tiger mosquito by Frankie, Connecticut Public Radio (June 12); was interviewed by the Coastal Connecticut Magazine about mosquitoes (June 20); National Geographic online published the article "Think your body is infested with insects? You're not alone," in which Dr. Ridge's work with Delusionary Infestation (DI) cases was highlighted (June 22); was quoted in online DI articles from Armenia News and News.am (June 25, 26); and was interviewed by NBC News about ticks in Connecticut (June 26).

DR. CLAIRE E. RUTLEDGE helped administer oral exams for The Tree Protection Exam-

ining Board (June 6); gave an interview about emerald ash borer and biological control to John Dankosky at WNPR in Hartford (June 18). It will be part of the program NEXT from the New England News Collaborative that will air on July 5.

DR. VICTORIA L. SMITH participated in the spring Cooperative Agricultural Pest Survey committee meeting, held in the Jones Auditorium (12 participants) (June 14); and participated in a meeting of the Yale Biosafety Committee, held at 135 College St., New Haven (20 participants) (June 21).

DR. KIMBERLY A. STONER presented a talk, "Beyond the Honey Bee – Native Bees of Connecticut" as the keynote of a symposium on bees at the Bruce Museum in Greenwich (65 adults attendees) (June 13); and presented a talk, "Planting for the Bees' Needs" at the Connecticut State Library in Hartford (45 adults attended) (June 21).

ENVIRONMENTAL SCIENCES

DR. PHILIP ARMSTRONG was interviewed by the Connecticut Post (June 5), WNPR (June 5), Fox news 61 (June 6), Stamford Advocate (June 14), and WTIC (June 26) about the statewide mosquito and arbovirus surveillance program, West Nile virus, the Asian Tiger mosquito, and other mosquito-related issues affecting Connecticut residents.

MR. GREGORY BUGBEE spoke on control of phragmites in Columbia Lake at a special meeting of the Columbia Board of Selectman held at Yeoman's Hall (approx. 50 attendees) (June 7); spoke on "Invasive Aquatic Plants in Lakes" on a pontoon boat at Lake Beseck Day (approx. 12 attendees) (June 16); and provided scientific expertise at a meeting on invasive aquatic plants in Crystal Lake in Middletown called by State Senator Len Suzio (approx. 10 attendees) (June 28).

DR. ANDREA GLORIA-SORIA participated in a career panel for early career female scientists pursuing a non-traditional/non-faculty track profession organized by the Women in Science at Yale (WISAY) group at Yale University (60 attendees) (June 19); and taught the "Documenting your research" lecture of the "Entering Research" class for first year Yale Undergraduates (25 students) (June 20).

DR. GOUDARZ MOLAEI was interviewed on the Tick Testing Program, current status of tick Activity in Connecticut, and tick bite prevention by Fox 61 (http://fox61.com/2018/06/06/mosquito-testing-program-takes-shape-in-connecticut/) (June 6), WFSB TV (http://www.wfsb.com/story/38414527/experts-say-state-is-on-track-for-a-typical-tick-year) (June 7), Hearst Connecticut Media Group (https://www.thehour.com/news/article/Percentage-of-Connecticut-ticks-testing-positive-12995287.php) (June 12), WTIC news talk 1080 (https://wtic.radio.com/articles/news/ag-station-another-bad-year-ticks) (June 25), WTNH Channel 8 news (http://www.wtnh.com/news/health/uptick-in-ticks-and-diseases-in-ct/1264751866) (June 26), NBC Connecticut/WVIT (https://www.nbcconnecticut.com/news/local/Researchers-Report-Peak-Tick-Season-486508261.html) (June 26), and CBS radio in Connecticut (June 27); spoke to Assistant Director Melanie McCloskey of the Specialty Services and Dermatology, Yale Health, about the CAES Tick Testing Program and how the Yale community and Health Center can submit ticks for testing (June 7); hosted Dr. John Paul Lavik the Yale Medical School and discussed mosquito and tick research projects and services offered in the Tick Testing Program (June 13); and hosted a group from Central Connecticut State University, New Britain at the CAES Tick Testing Laboratory and discussed ticks and mosquitos and their disease-causing pathogens (15 students, 1 faculty) (June 20).

MR. JOHN SHEPARD spoke to students from Central Connecticut State University about the State Mosquito Trapping and Testing Program, West Nile Virus, and Eastern Equine Encephalitis (15 students, 1 professor) (June 20).

FORESTRY AND HORTICULTURE

DR. JEFFREY S. WARD administered practical and oral examination to arborist candidates for the Connecticut Tree Protection Examining Board (June 6); participated in an Executive Committee meeting of the New England Society of American Foresters in Concord, NH (June 13); and met with Mark Ashton (Yale), Karen Bennet (Univ. New Hampshire), and Isabel Munck (USDA Forest Service) to discuss oak management in Union (June 28).

DR. ABIGAIL A. MAYNARD visited Hindinger's Farm in Hamden to discuss collaborative work (June 4); and assisted in harvesting vegetables at the Learning Garden at Hamden Hall Country Day School (2 teachers, 32 students) (June 5).

DR. SCOTT C. WILLIAMS participated in a meeting of the Advisory Board of the Environmental Science Program at Middlesex Community College (June 11).

MR. JOSEPH P. BARSKY participated in an Executive Committee meeting of the New England Society of American Foresters in Concord, NH (June 13).

PLANT PATHOLOGY AND ECOLOGY

DR. WADE ELMER sponsored a chestnut planting event with the Connecticut Hiking alliance where a dozen hybrid chestnuts were planted in a state forest where resident American chestnut had sprouted (23 attendees) (June 3); and attended a Faculty Strategy Meeting at the University of Minnesota for the Center for Sustainable Nanotechnology (June 11-12).

DR. YONGHAO LI staffed the CAES booth in the Greater New Haven Bonsai Show in Hamden (June 2); presented "Spring weather conditions and foliar diseases of Christmas trees" at the CCTGA twilight meeting in New Milford (30 adults) (June 19); and presented "PDIO and Plant Disease Diagnosis" to CCSU students and faculty during the CAES tour in New Haven (15 adults) (June 20).

DR. ROBERT MARRA performed tomographic scans on a white oak tree for the city of Trumbull (June 5) and on a copper beech for Almstead Tree Care, in Harrison, NY (June 8); and participated as a supplemental examiner in oral exams for the Tree Protection Examining Board (June 6).

DR. LINDSAY TRIPLETT began the second year of CAES and Southern CT State University's joint USDA-funded internship program, the Summer Undergraduate Fellows in Plant Health and Protection on June 11 and will run through Plant Science Day. Ten students from 9 universities nationwide are working on summer research projects with CAES and SCSU scientists and living in apartments at SCSU. In June, the students received training in farm and lab safety and formal science communication, visited Massaro Organic Farm, and set up a field plot testing the role of nanoparticle treatments on Chrysanthemum Wilt. The program will culminate in a presentation of their group project at Plant Science Day, followed by oral presentations of their individual research projects in a lunch seminar the following day.

2018 Interns L to R: Tia Brown (working with Dr. Lindsay Triplett), Lance Moore (Dr. Jeff Ward), Ceara Wetterman (Dr. Blaire Steven), Zach Seltzer (Dr. Quan Zeng), Jillian Tate (Dr. Claire Rutledge), Gillian Page (Dr. Elizabeth Roberts, SCSU), Victoria Romero (Dr. James Kearns, SCSU), Collette McMahon (Dr. Nubia Zuverza-Mena), Kelvin Mintah (Dr. Wade Elmer), and Melvin Mercado-Ayala (Dr. Bob Marra).

Buckeye Gala apple trees being planted at Lockwood farm (June 1). In the picture, undergraduate interns Jaime , Sali Diallo and farm manager Rich Cecarelli.

The Connecticut Hiking Alliance participated in a chestnut planting event June 3 in Bethany, CT

VALLEY LABORATORY

DR. JATINDER S. AULAKH presented a talk "Chemical control of invasive plant species" and a research demonstration "Herbicide application techniques for invasive plant control" at the invasive plant control workshop held at the Valley Laboratory (89 participants) (June 12); participated in the CIPWG meeting (June 19); and talked about weed management and backpack sprayer calibration at the CCTGA twilight meeting (25 attendees) (June 19).

DR. CAROLE CHEAH toured Edgerton Park, City of New Haven, to check and discuss the health of the hemlocks with members of the Board of the Edgerton Park Conservancy (8 attendees) (May 4); participated and spoke on old growth hemlocks during a tour of Great Mountain Forest Corporation, Norfolk (13 attendees) (May 29); Gave two presentations and demonstrations on biological control of mile-a-minute weed at the Invasive Plant Control Workshop, at the Valley Laboratory, Windsor (89 attendees) (June 12); met with Ann Astarita, Director of the Roxbury Land Trust to check hemlocks at the Mine Hill Preserve and talked to students and a teacher from the University of Bridgeport Summer Scholars Program on biological control of HWA (4 attendees) (June 15); and gave a presentation on biological control of hemlock woolly adelgid at the University of Connecticut Hot Topics series for the Master Gardeners Program (200 attendees) (June 20).

DR. RICHARD COWLES participated in the CT Christmas Tree Grower's Association twilight meeting, New Milford (25 attendees) (June 19); and presented "Zimmerman pine moths" and "Growing exotic firs to avoid phytophthora root" for the MA Christmas Tree Growers' Association, Southwick, MA (40 attendees) (June 23).

ROSE HISKES participated in the Cooperative Agricultural Pest Survey (CAPS) meeting at The Connecticut Agricultural Experiment Station in New Haven (June 14); participated in the Spotted Lanternfly response meeting at The Connecticut Agricultural Experiment Station in New Haven (June 14); and participated in the Symposium Planning Committee meeting of the Connecticut Invasive Plant Working Group in Windsor (June 19).

DR. JAMES LAMONDIA welcomed participants at the CAES Invasive Plant Workshop held at the Valley Laboratory (89 attendees) (June 12); and chaired the APS Division Forum meeting held in

conjunction with the APS Pacific Division annual meeting in Portland, Oregon (125 attendees) (June 24-28).

DR. DEWEI LI was interviewed by Christine Woodside, Connecticut Health Investigative Team, Editor, Appalachia journal on indoor molds and their health effects (May 14).

DEPARTMENTAL RESEARCH UPDATES JUNE 2018

Cui, Z., Yuan, X., Yang, C.H., **Huntley, R.B.**, Sun, W., Wang, J., Sundin, G.W., and **Zeng, Q.** (2018) Development of a method to monitor gene expression in single bacterial cells during the interaction with plants and use to study the expression of the type III secretion system in single cells of *Dickeya dadantii* in potato. **Front. Microb.** doi: 10.3389/fmicb.2018.01429

Abstract-*Dickeya dadantii* is a bacterial plant pathogen that causes soft rot disease on a wide range of host plants. The type III secretion system (T3SS) is an important virulence factor in *D. dadantii*. Expression of the T3SS is induced in the plant apoplast or in *hrp*-inducing minimal medium (hrp-MM), and is repressed in nutrient-rich media. Despite the understanding of induction conditions, how individual cells in a clonal bacterial population respond to these conditions and modulate T3SS expression is not well understood. In our previous study, we reported that in a clonal population, only a small proportion of bacteria highly expressed T3SS genes while the majority of the population did not express T3SS genes under hrp-MM condition. In this study, we developed a method that enabled *in situ* observation and quantification of gene expression in single bacterial cells *in planta*. Using this technique, we observed that the expression of the T3SS genes *hrpA* and *hrpN* is restricted to a small proportion of *D. dadantii* cells during the infection of potato. We also report that the expression of T3SS genes is higher at early stages of infection compared to later stages. This expression modulation is achieved through adjusting the ratio of T3SS ^{ON} and T3SS ^{OFF} cells and the expression intensity of T3SS ^{ON} cells. Our findings not only shed light into how bacteria use a bi-stable gene expression manner to modulate an important virulence factor, but also provide a useful tool to study gene expression in individual bacterial cells *in planta*.

Hao, Y.; Yuan, W.; **Ma, C.; White, J.C.**; Zhang, Z.; Hou, T.; Dong, Y.; Wang, Q.; Wang, R.; Xiang, Y.; Xiang, Z.; Dong, W.; Xing, B.; Zhou, T.; Rui, Y. 2018. Engineered nanomaterials suppress Turnip mosaic virus infection in *Nicotiana benthamiana*. *Environ. Sci.: Nano* 10.1039/C8EN00014J.

Abstract- Tobacco (*Nicotiana benthamiana*) and Turnip mosaic virus (TuMV) were used as a model system to investigate the potential of engineered nanomaterials (ENMs) for promoting crop growth and resistance to viral infection. A 5 mL ENM suspension of 50 or 200 mg/L consisting of either two metal-based nanoparticles (NP Fe2O3 or TiO2) or two carbon-based nanomaterials (NMs) (MWCNTs or C60) was foliar-sprayed onto the leaf surface of tobacco daily for 21 days. Fully developed young leaves were then inoculated with TuMV tagged with GFP protein and were cultivated for 5 days. Exposure to both metal- and carbon-based NMs significantly increased shoot biomass by approximately 50%. TEM images demonstrated that exposure to NMs did not alter cellular integrity; both NP Fe2O3 and TiO2 preferentially accumulated in chloroplasts. Florescent images of TuMV abundance on the leaf surfaces suggest that NMs significantly inhibited viral proliferation as measured by fluorescent intensity on newly emerged leaves. Approximately 15-60% decreases in the relative amount of TuMV coat proteins could further explain the mechanisms by which NMs suppressed viral infection. Increases in phytohormone levels of 40% also suggest that NMs play an important role in stimulating plant growth and activating defense mechanisms. These findings contribute to our understanding of the sustainable use of ENMs in agriculture.

Weger-Lucarelli, J., Rückert, C., Grubaugh, N.D., **Misencik, M.J., Armstrong, P.M.,** Stenglein, M.D., Ebel, G.D., and **Brackney, D.E.**, Adventitious viruses persistently infect three commonly used mosquito cell lines, Virology, doi.org/10.1016/j.virol.2018.06.007

Abstract- Mosquito cell lines have been used extensively in research to isolate and propagate arthropod-borne viruses and understand virus-vector interactions. Despite their utility as an in vitro tool, these cell lines are poorly defined and may harbor insect-specific viruses. Accordingly, we screened four commonly-used mosquito cell lines, C6/36 and U4.4 cells from Aedes albopictus, Aag2 cells from Aedes aegypti, and Hsu cells from Culex quinquefasciatus, for the presence of adventitious (i.e. exogenous) viruses. All four cell lines stained positive for double-stranded RNA, indicative of RNA virus replication. We subsequently identified viruses infecting Aag2, U4.4 and Hsu cell lines using untargeted next-generation sequencing, but not C6/36 cells. PCR confirmation revealed that these sequences stem from active viral replication and/or integration into the cellular genome. Our results show that these commonly-used mosquito cell lines are persistently-infected with several viruses. This finding may be critical to interpreting data generated in these systems.

Xiao, F., Gámiz, B., and **Pignatello, J.J.*,** Adsorption and Desorption of Nitrous Oxide on Raw and Thermally Air-Oxidized Chars, Science of The Total Environment, 643, 1436-1445 (2018); doi.org/10.1016/j.scitotenv.2018.06.280

Abstract- Addition of biomass chars (biochar) to soil reportedly suppresses emissions of nitrous oxide (N2O), a potent greenhouse and ozone-depleting gas, but the causes and endurance of the effect are unclear. To determine whether adsorption may play a role, adsorption isotherms of N2O were constructed at 273 K on outgassed samples of anoxically-prepared wood-derived chars (300 -700 oC) and on a subset briefly reheated in air at 400 oC. Sorption by the chars was greater and more reversible than sorption by soils or soil mineral phases. Adsorption by chars increased with pyrolysis temperature after post-pyrolysis air oxidation. The Langmuir maximum capacity correlates well with the CO2-determined (but not N2-B.E.T.-determined) surface area. At environmentally realistic partial pressures in soil, N2O adsorption correlates with CO2 adsorption, and is found to predominate in the micropores (<1.5 nm), especially ultramicropores (< 0.7 nm). Neither adsorption nor adsorption reversibility was affected by coating the char with soil organic matter extract. It is concluded that char added at levels above 1% in soil would act as a strong and reversible sink for N2O, and could be responsible for the temporary nature of emission suppression observed in some cases.

JOURNAL ARTICLES APPROVED JUNE 2018

Dimkpa, C. O., U. Singh, P. S. Bindraban, **Wade H. Elmer**, J. Gardea-Torresdey, and **Jason C. White**. Exposure to weathered and fresh nanoparticle and ionic Zn in soil promotes grain yield and modulates nutrient acquisition in winter wheat (*Triticum aestivum*). *Journal of Agricultural and Food Chemistry*

Elmer, Wade H., **Chuanxin Ma**, and **Jason C. White**. Nanoparticles in plant disease management. *Current Opinion in Environmental Science and Health*

Majumdar, S., **Chuanxin Ma**, M. Villani, L. Pagano, **Nubia Zuverza-Mena**, Y. Huang, A. Zappettini, A. Keller, N. Marmiroli, O. Parkash, and **Jason C. White**. Surface coating determines the response of soybean plants to cadmium sulfide quantum dots. *Environmental Science: Nano*

Marra, Robert E., Nicholas J. Brazee, and Shawn Fraver. Estimating carbon loss due to internal decay in living trees using tomography: implications for forest carbon budgets. *Environmental Research Letters: Special Focus on Carbon Monitoring Systems Research and Applications*

McGehee, C., R. E. Raudales, **Wade H. Elmer**, and R. McAvoy. Efficacy of biofungicides against root rot and damping-off of microgreens caused by *Pythium* spp. *Crop Protection*

Thekkiniath, J., S. Mootien, L. Lawres, B. A. Perrin, M. Gewirtz, P. Krause, **Scott C. Williams**, S. Doggett, M. Ledizet, and C. B. Mamoun. BmGPAC: an antigen capture assay for detection of

active *Babesia microti* infection. *Journal of Clinical Microbiology*

Weger-Lucarelli, J., C. Rückert, N. D. Grubaugh, **Michael J. Misencik**, **Philip M. Armstrong**, M. D. Stenglein, G. D. Ebel, and **Doug E. Brackney**. Adventitious viruses persistently infect three commonly used mosquito cell lines. *Virology*

White, Jason C. and J. Gardea-Torresdey. Nanotechnology and agriculture: the path to food security may be through the very small. *Nature Nanotechnology*

ARTICLES OF INTEREST JUNE 2018

Invasive Plant Control Workshop held at the Valley Laboratory

Eighty-nine people attended the Connecticut Agricultural Experiment Station's Invasive Plant Control Workshop "From Theory to Practice" on June 12, 2018. Dr. Jim LaMondia welcomed participants and spoke about research and services at the Experiment Station Valley Laboratory. The Theory (Indoor sessions) included "Invasive impacts, control techniques, and project management" presented by Dr. Jeff Ward; "Chemical control of mugwort (*Artemisia vulgaris*), garlic mustard (*Alliaria petiolata*), and Japanese knotweed (*Fallopia japonica*)", presented by Dr. Jatinder Aulakh; "Biological control of mile-a-minute (*Persicaria perfoliata*)" by Dr. Carole Cheah; and "Controlling Japanese barberry (*Berberis thunbergii*) to reduce risk of Lyme disease", by Dr. Scott Williams. The Practice (outdoor sessions) included "Foliar application, cut stem, and stem injection methods for Japanese knotweed control" by Dr. Aulakh; "Mechanical control techniques" by Dr. Williams; "Biological controls" presented by Dr. Cheah; and "Directed heating with propane torches" by Dr. Ward. The workshop qualified for 6 CEU's for CT Rights-of-Way (6) and Ornamentals & Turf (3A); and 2.0 CEU's for CT Foresters, Supervising Forest Products Harvesters, and Forest Products Harvesters. Farm Manager Jim Preste and Jane Canepa-Morrison assisted with much of the behind-the-scenes work for the meeting.

Dr. Yi Yang received The Water Travel Awards for 2018 of 800 Swiss Francs supporting her expenses to an international conference, the 256th American Chemical Society National Meeting & Expo—Nanoscience, Nanotechnology & Beyond, in August, 2018, where she will present the talk "Oxidation of Organic Contaminants by Unactivated Peroxymonosulfate: Roles of Reactive Species and Direct Oxidation."

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STATION NEWS

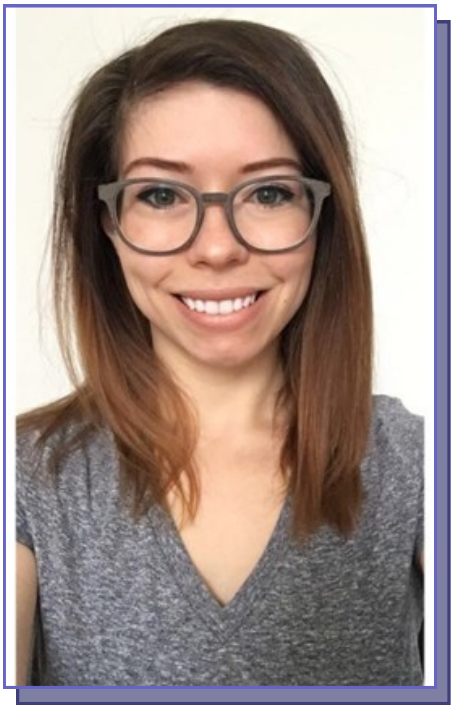
NEW STAFF, STUDENTS, AND VOLUNTEERS JUNE 2018

Dr. Elisha Allan-Perkins joined the Valley Laboratory in May as a Postdoctoral Research Scientist studying the feasibility of growing hops in Connecticut, hop diseases, and boxwood blight. She specializes in plant pathology focusing on fungi and nematodes. She earned her doctoral degree from the University of Massachusetts Amherst studying the effects of organic and conventional management practices on the soil bacteria, fungi, and nematodes of turfgrass maintained for golf courses and athletic fields. She has earned degrees in Zoology (M.S.) and Biology (B.S.) from the University of New Hampshire.

2018 Seasonal workers at the Valley Laboratory. Left to right: Nick Keegan (Cental Connecticut State University), Aran Morgan (Cental Connecticut State University), Jordan Wojciekofsky (University of New Haven), Valerie Perzanowski (Tunxis Community College), Katie Jacob (University of Vermont), Hannah Milewski (University of Connecticut), Nick Czarnowski (Eastern Connecticut State University), Ethan Paine (University of Connecticut), and Joe Braun (Westfield State University). Nick Keegan and Jordan Wojciekofsky work with Dr. Jatinder Aulakh. Katie Jacob, Hannah Milewski and Ethan Paine work with Dr. Richard Cowles. Nick Czarnowski and Joe Braun work with Dr. Jim LaMondia. Aran Morgan and Valerie Perzanowski work with Mr. Jim Preste. Not pictured was Jason Flynn, working for Jim Preste.

Left to right: Nick DeVito, Mallery Breban, Victoria Dahm, Darya Pokutnaya, Doug Vuong, working with Dr. Goudarz Molaei.

Employees (left to right): Bill Sennett (UConn); Chris Driscoll (Stonehill College); Noelle Khalil (UConn); Ryan Gregory (Quinnipiac Univ.) Danielle Sohai (George Washington Univ.); Michael Olson (Tulane Univ.); Demi Rodriguez (Clark Univ.); Stephanie Canales (CCSU) Dan Cole (UConn); Riley Doherty (UConn); Andrew Donnelycolt (Univ. of New Haven); Summer Stebbins (Boston Univ.); Not pictured: Duncan Cozens (Quinnipiac Univ.), Jack Miller Jr working with the Department of Environmental Sciences.



Jacquelyn (Jackie) LaReau (MSc Student Quinnipiac University) working with Blaire Steven, and Patrick "PJ" Conway III (MSc in Biomedical Sciences at Quinnipiac University), working with Doug Brackney.

Connor McLaughlin, Biomedical Engineering, University of Connecticut working with Joe Pignatello.

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Putting Science to Work for Society.

Main Laboratories, New Haven

Lockwood Farm, Hamden

Griswold Research Center, Griswold

Valley Laboratory, Windsor

The Connecticut Agricultural Experiment Station

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

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