

Station News

The Connecticut Agricultural Experiment Station
Volume 11 Issue 8 August 2021



This Issue

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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CAES

The Connecticut Agricultural Experiment Station

Putting Science to Work for Society since 1875

ADMINISTRATION

DR. JASON C. WHITE participated in the FDA Laboratory Flexible Funding Model (LFFM) year 2 kick-off call (July 1); participated in the weekly NSF Center for Sustainable Nanotechnology (CSN) All-Hands calls (July 7, 21, 28); with **DR. WADE ELMER** and **DR. YI WANG**, hosted a ZOOM meeting with collaborators at the University of Massachusetts Amherst to discuss a joint USDA project on nanoscale sulfur (July 9); participated in the FDA Rapid Response Team (RRT) monthly webinar series (July 8); participated in the monthly FDA LFFM ZOOM calls for Human and Animal Food and Food Defense (July 12); with **DR. WADE ELMER**, hosted a ZOOM meeting with collaborators at Johns Hopkins University to discuss a joint USDA project on nanoscale phosphorus (July 13); participated in a monthly NSF CSN Faculty ZOOM call (July 13); hosted a reception and showing of the artwork in the lobby of the Jenkins-Waggoner Laboratory (July 13); with **DR. SARA NASON** and **DR. NUBIA ZUVERZA-MENA**, participated in a ZOOM call with colleagues at Yale University and the University of Minnesota to discuss a joint NIEHS grant (July 14); participated in an Elsevier webinar for new Associate Editors of *NanoImpact* (July 19); hosted the NSF CSN monthly Nanochem-Plant working group ZOOM call (July 20); participated in a meeting with CT Department of Agriculture staff to discuss the upcoming FDA sample requirements and contract (July 22); participated in the International Webinar on “Agricultural Nanotechnology: Influencing the Future of Farming Sustainability” at the University of the Punjab in Lahore, Pakistan, and gave a presentation (remotely) entitled “The Use of Nanoscale Nutrients to Increase Crop Tolerance to Biotic and Abiotic Stress” (July 29); and participated in the Yale School of Public Health Summer Research Experience in Environmental Health Sciences Webinar and gave a presentation entitled “Environmental Health and Science Research at the CT Agricultural Experiment Station” (July 30).

ANALYTICAL CHEMISTRY

DR. BRIAN EITZER attended the Food and Drug Administration (FDA) Laboratory Flexible Funding Model (LFFM) kick-off (July 1); and moderated a panel discussion on the analysis of pesticides during the 57th North American Chemical Residue Workshop, which was held online (110 attendees online during pesticide forum) (July 26-30).

DR. CHRISTINA ROBB attended the Food and Drug Administration (FDA) Laboratory Flexible Funding Model (LFFM) kick-off (July 1); attended an Eastern Analytical Symposium (EAS) Program meeting (July 1); attended an EAS Executive Committee meeting (July 5); attended FDA sampling funding meetings (July 15); and became a member of the European Chemical Society-Division of Analytical Chemistry (EuChemS-DAC) study group and network, which has Green Sample Preparation as the 2021 theme of the year (July 19).

DR. CHRIS DIMKPA was appointed an Affiliate of the Center for Sustainable Nanotechnology (CSN). The CSN is a multi-institutional partnership aimed at developing a molecular-level understanding of the fundamental chemical and physical processes governing the transformation and interactions of nanoparticles in the environment (July 6).

ENTOMOLOGY

DR. KIRBY C. STAFFORD III participated in a celebration at Massaro Farm in Woodbridge for **DR. KIMBERLY STONER** being awarded the Bill Duesing Organic Living on the Earth Award by CT-NOFA (July 13); participated in a meeting of the Cooperative Agricultural Survey committee (July 14); with **MS. JAMIE CANTONI**, staffed a table on ticks at the Connecticut Tree Protective Association (CTPA) summer meeting (July 15); gave a ZOOM presentation on ticks and tick-borne disease for the Essex Library (21 attendees; recorded for later viewers) (July 27); was interviewed about spotted lanternfly by Katrina Koerting, *News-Times* (July 29); and was interviewed about spotted lanternfly by Abigail Broom, *Norwalk Hour* (July 29).

DR. VICTORIA L. SMITH recorded a podcast with Brian Scott-Smith, discussing spotted lanternfly and other topics (July 2); participated in the virtual Spring/Summer meeting of the Cooperative Agricultural Pest Survey Committee (July 14); participated in the summer meeting of the Connecticut Tree Protective Association, held at the Farmington Club, with a display entitled “BOLO: Spotted Lanternfly and Box Tree Moth” (July 15); and participated in the virtual 95th annual meeting of the National Plant Board, with a presentation entitled “Beech Leaf Disease: Why It’s Important” (July 26-29).

ENVIRONMENTAL SCIENCES

DR. JOSEPH PIGNATELLO met virtually with Asst. Attorney General David Wrinn and Director Jason White on eligibility status of CAES with the National Science Foundation (July 6).

DR. PHILIP ARMSTRONG was interviewed about the wet summer and the unusually high number of mosquitoes collected this season by NBC CT (July 19), *News-Times* (July 20), and WTIC (July 22); and was interviewed about the long-term impacts of climate change on mosquito populations by *Pest Control Technology* (July 27).

MR. GREGORY BUGBEE gave a talk entitled “Bashan Lake - Aquatic Plant Update” at the annual meeting of the Bashan Lake Association held at the East Haddam Grange (approx. 75 attendees) (July 21); and, as President of the Northeast Aquatic Plant Management Society, presided over the society’s mid-term Executive Committee meeting (July 27).

DR. GOUDARZ MOLAEI gave a virtual invited talk entitled “Public Health Challenges of Ticks and Tick-Associated Diseases” to the West Hartford Public Library (60 attendees) (July 13).

DR. SARA NASON met virtually with researchers at Yale and the University of Minnesota to discuss collaborative research (July 14,); met virtually with Bryan Berger from the University of Virginia to discuss a joint proposal (July 26); attended a virtual meeting of the Benchmarking and Publications for Nontargeted Analysis working group (July 28); and attended a virtual networking event and capstone presentations for the Doris Duke Conservation Scholars program (July 29-30).

MR. JOHN SHEPARD participated in Arbovirus Situational Awareness conference calls organized by the Northeast Regional Center for Excellence in Vector-Borne Diseases (30 participants) (July 19).

DR. BLAIRE STEVEN is the lead author of an article selected as Editor's Pick in *Phytobiomes Journal* entitled "Inoculation of stigma colonizing microbes to apple stigmas alters microbiome structure and reduces the occurrence of fire blight disease," by Cui Z., Huntley R. B., Schultes N., Steven B., and Zeng Q. (2021). <https://doi.org/10.1094/PBIOMES-04-20-0035-R>.

FORESTRY AND HORTICULTURE

DR. JEFFREY S. WARD spoke on tree identification and curious facts at the Connecticut Tree Protective Association summer meeting held in Farmington (100 attendees) (July 15); and participated in a Yankee SAF fall meeting planning ZOOM call (July 30).

DR. SUSANNA KERIÖ attended the Connecticut Tree Protective Association summer meeting in Farmington (July 15); served on the CT Urban Forestry Council's RFP committee (July 20); and participated in the CT Urban Forestry Council (July 22).

DR. SCOTT C. WILLIAMS presented an invited ZOOM lecture entitled "Tick Talk" for the lecture series hosted by the Town of Guilford's Conservation Commission (51 attendees) (July 7); as a sitting advisory member, participated in a biweekly meeting of the National Wildlife Tick-Borne Disease Program (July 8); presented an invited ZOOM lecture entitled "Use of Repellents in Deterring Deer and Rabbit Damage" at the Summer Meeting of the Connecticut Nursery & Landscape Association (39 attendees) (July 28).

PLANT PATHOLOGY AND ECOLOGY

DR. WADE ELMER attended via ZOOM the NIFA plan of work conference webinar (51 attendees) (July 7); with **DRS. JASON WHITE** and **YI WANG**, participated via ZOOM in the CAES-UMASS Nano S update (6 attendees) (July 9); attended the CAES Art Open House in Jenkins-Waggoner (25 attendees) (July 13); held a ZOOM conference with Drs. Robert McGovern and Meg McGrath concerning their Springer publication (July 16); attended via ZOOM the CNS Plant Nano Group meeting (26 attendees) (July 20); attended via ZOOM the monthly APS Foundation Committee meeting (9 attendees) (June 21); attended the APS Ornamental Disease Committee meeting (43 participants) (July 26); had a ZOOM conference with Ms. Jaya Borgatta for nano P research at CAES (July 27); gave a virtual presentation entitled "Nano Cu for Plant Disease Management" at the University of Punjab, Pakistan (102 participants) (July 29).

DR. YONGHAO LI was interviewed about vegetation management and plant diseases for the Forest Management Research via WebEx by UConn graduate student researchers, Jacob Cabral and Emlyn Crocker (July 1); was interviewed about climate change and food production by Ms. Jan Spiegel from the *CT Mirror* (July 2); was interviewed about summer weather and plant diseases by Robert Miller from the *News-Times* (July 14); staffed the CAES booth and presented a poster entitled "Impacts of Drought Stress on Arborvitae in 2020" at the Connecticut Tree Protective Association summer meeting held in Farmington (July 15).

DR. STEPHEN J. TAERUM presented "Exploring Protist Communities in the Phyllosphere: Emerging Patterns in Diversity, Structure, and Bacterial Interactions" at the Phyllosphere Fortnight 2021 meeting (60 attendees) (July 22).

DR. QUAN ZENG participated in the Bacteriology Committee meeting at the online conference Plant Health 2021 (July 26) and Soil Microbiology Committee meeting (July 27) and had a conference call with Dr. Alejandro Rojas (University of Arkansas) and Ms. Elaine de Gutzman (*Frontiers in Plant Science*) to discuss initiating a research topic article collection with the journal *Frontiers in Plant Science* (July 30).

VALLEY LABORATORY

DR. CAROLE CHEAH was interviewed about the resurgence of hemlock woolly adelgid (HWA) by Mattie Vandriver for *Norfolk Now* (July 14); and was interviewed on the biological control release of *Sasajiscymnus tsugae*, a HWA predator, at the Great Mountain Forest in Norfolk in July 2021 by Mary Neill for the *Great Mountain Forest Newsletter* (July 30).

MS. ROSE HISKES, with Dr. Todd Mervosh, led a walk and talk on invasive plants at the summer Connecticut Tree Protective Association meeting at the Farmington Club (~100 attendees) (July 15); and organized a Connecticut Invasive Plant Working Group “Invasive Plant Walk, Talk and Cut” at The Preserve state park in Old Saybrook (17 attendees) (July 17).

DR. JAMES LAMONDIA spoke about “Fungicides and Management Implications for Boxwood Health” during the AmericanHort Cultivate21 meeting held in Columbus, OH (50 attendees) (July 11); met with Lewis Flowers of Universal Leaf to discuss breeding varieties for resistance to pathogens (July 13); met virtually with SCRI colleagues to revise a boxwood chapter in an APS Press book on woody ornamental diseases (July 19); and participated in a Society of Nematologists Honors and Awards Committee meeting (July 27).

ADMINISTRATION:

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STATION NEWS



International Webinar on Agricultural Nanotechnology

Influencing the future of farming sustainability





Patron-in-Chief
Prof. Dr. Niaz Ahmad Akhtar
Vice Chancellor
University of the Punjab



Patron
Prof. Dr. M. Saleem Haider
Dean, FAS
University of the Punjab



Chief Organizer
Prof. Dr. Tehmina Anjum
Chairperson, DPP
University of the Punjab



Organizer
Dr. Zail-E-Huma
Incharge, Agribusiness Center,
University of the Punjab

Invited Speakers



Dr. Norman Roy Scott
Professor Emeritus, Dept. of
Biological & Environmental Engineering,
Cornell University Ithaca NY, USA

← Nanoscale science and engineering
to advance the agriculture and food system



Dr. Jason C. White
Director, The Connecticut
Agricultural Experiment Station,
New Haven Station USA

← The use of nanoscale nutrients to
increase crop tolerance to biotic and
abiotic stress



Dr. Wade H. Elmer
Vice Director Dept. of Plant Pathology and Ecology,
The Connecticut Agricultural Experiment Station,
New Haven Station, USA

← Nano Cu for plant disease management



Dr. Irfan S. Ahmad
EXEC DIR, College of Agricultural,
Consumer & Environmental Sciences,
University of Illinois Urbana Champaign, USA

← Bionanotechnology toward
Environment Friendly Agriculture

Thursday 29th July, 2021
Timings: Start at: 04 PM (GMT + 5)
For Registration:
<https://my.forms.app/form/60ebe78d2ca34f5aa4b8e0bc>
Zoom link:
<https://us02web.zoom.us/j/83966267345?pwd=WldYTkdkdFewaHBCU1NxVEs5SUx5UT09>

For further information:
Dr. Waheed Anwar
Email: waheedanwar.dpp@pu.edu.pk
Mob: +92 3347356228
Dr. Adnan Akhter
Email: adnanakhter.iags@pu.edu.pk
Mob: +92 3226023186

DEPARTMENT OF PLANT PATHOLOGY

Faculty of Agricultural Sciences
University of the Punjab
Lahore, Pakistan

ENVIRONMENTAL SCIENCES:

1. Steven, B., Hyde, J., LaReau, J. C., and Brackney, D. E. 2021. The axenic and gnotobiotic mosquito: Emerging models for microbiome host interactions. *Frontiers in Microbiology* 12:714222.

Abstract: The increasing availability of modern research tools has enabled a revolution in studies of non-model organisms. Yet, one aspect that remains difficult or impossible to control in many model and most non-model organisms is the presence and composition of the host-associated microbiota or the microbiome. In this review, we explore the development of axenic (microbe-free) mosquito models and what these systems reveal about the role of the microbiome in mosquito biology. Additionally, the axenic host is a blank template on which a microbiome of known composition can be introduced, also known as a gnotobiotic organism. Finally, we identify a “most wanted” list of common mosquito microbiome members that show the greatest potential to influence host phenotypes. We propose that these are high-value targets to be employed in future gnotobiotic studies. The use of axenic and gnotobiotic organisms will transition the microbiome into another experimental variable that can be manipulated and controlled. Through these efforts, the mosquito will be a true model for examining host microbiome interactions.

2. McMillan, J. R., Harden, C. A., Burtis, J. C., Breban, M. I., Shepard, J. J., Petruff, T. A., Misencik, M. J., Bransfield, A. B., Poggi, J. D., Harrington, L. C., Andreadis, T. G., and Armstrong, P. M. (2021), The community-wide effectiveness of municipal larval control programs for West Nile virus risk reduction in Connecticut, USA. *Pest Manag. Sci.* July 16; <https://doi.org/10.1002/ps.6559>

Abstract: Mosquito larval control through the use of insecticides is the most common strategy for suppressing West Nile virus (WNV) vector populations in Connecticut (CT), USA. To evaluate the ability of larval control to reduce entomological risk metrics associated with WNV, we performed WNV surveillance and assessments of municipal larvicide application programs in Milford and Stratford, CT in 2019 and 2020. Each town treated catch basins and nonbasin habitats (Milford only) with bi-pesticide products during both WNV transmission seasons. Adult mosquitoes were collected weekly with gravid and CO₂-baited light traps and tested for WNV; larvae and pupae were sampled weekly from basins within 500 m of trapping sites, and *Culex pipiens* larval mortality was determined with laboratory bioassays of catch basin water samples. Declines in 4th instar larvae and pupae were observed in catch basins up to 2-week post-treatment, and we detected a positive relationship between adult female *C. pipiens* collections in gravid traps and pupal abundance in basins. We also detected a significant difference in total light trap collections between the two towns. Despite these findings, *C. pipiens* adult collections and WNV mosquito infection prevalence in gravid traps were similar between towns. Larvicide applications reduced pupal abundance and the prevalence of host-seeking adults with no detectable impact on entomological risk metrics for WNV. Further research is needed to better determine the level of mosquito larval control required to reduce WNV transmission risk.

3. Nason, S. L., Stanley, C. J., PeterPaul, C. E., Blumenthal, M. F., and Zuzverza-Mena, N. 2021. A community based PFAS phytoremediation project at the former Loring Airforce Base. *iScience* 24(7):102777. <https://dx.doi.org/10.1016%2Fj.isci.2021.102777>

Abstract: The Loring Airforce Base (AFB) in Aroostook County, Maine, USA was active from 1947 through 1994. Like many military sites, it has a substantial history of pollution from a wide variety of toxins. Currently, some of the AFB land belongs to the Micmac Nation, an Indigenous tribe, who are very concerned about the contamination on the land. Starting in 2019, a group of community activists, research scientists, and tribal members came together to test methods for cleaning the land. This backstory features perspectives from six project participants.

JOURNAL ARTICLES APPROVED JULY 2021

Elmer, Wade H. Nitrogen and plant disease. In: *Mineral Nutrition and Plant Disease*, L. E. Datnoff, W. H. Elmer, and F. Rodrigues, editors. American Phytopathological Society, St. Paul, MN.

Huang, L., J. He, C.-M. Tian, and **De-Wei Li**. Bambusicolous fungi and diseases and other pests of bamboo. In: *Forest Tree Health*.

Khalil, Noelle, Eliza A. H. Little, K. I. Akaratovic, J. P. Kiser, C. F. Abadam, K. J. Yuan, Michael J. Misencik, Philip M. Armstrong, and Goudarz Molaei. Host associations of *Culex pipiens*: A two-year analysis of bloodmeal sources and implications for arboviral transmission in Southeastern Virginia. *Vector-Borne and Zoonotic Diseases*.

Krol, Walter J., Brian D. Eitzer, Christina S. Robb, Christian O. Dimkpa, Michael Ammirata, Craig Musante, Kitty Prapayotin-Riveros, and Jason C. White. Pesticide residues and arsenic found in human and animal food sold in Connecticut in 2020: MFRPS-LFFM ISO 17025:2017 food testing. *CAES Technical Bulletin*.

Linske, Megan A., Scott C. Williams, Kirby C. Stafford III, and A. Li. Fipronil-based rodent-targeted bait box deployment configuration and *Peromyscus leucopus* abundance drive effective management of parasitizing juvenile *Ixodes scapularis*. *Journal of Medical Entomology*.

Maynard, Abigail A. Kabocha squash trials 2014-2016. *CAES Bulletin*.

Sakhno, Y., C. Ma, **Jason C. White**, and D. Jaisi. Role of cation substitution in calcium phosphate based novel nanofertilizer impacts on lettuce (*Lactuca sativa*) yield. *ACS Sustainable Chemistry and Engineering*.

Teng, M., X. Zhao, F. Wu, C. Wang, **Jason C. White**, C. Wang, L. Zhou, M. Duan, and W. Zhao. Polystyrene nanoplastic toxicity to zebrafish: Dysregulation of the brain-intestine-microbiota axis. *Nature Nanotechnology*.

Zhang, K., W. Guo, **De-Wei Li**, and R. F. Castañeda-Ruiz. *Vanakripa chinensis* sp. nov. from China and notes on the genus. *Mycotaxon*.



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



Main Laboratories, New Haven



Lockwood Farm, Hamden

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

Griswold Research Center
190 Sheldon Road
Griswold, CT 06351-3627
Phone: 860-376-0365



Griswold Research Center, Griswold



Valley Laboratory, Windsor

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. Jason White, Ms. Vickie Bomba-Lewandoski, Ms. Sandra Carney, and Ms. Kelly Fairbrother.



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