

# Station News

The Connecticut Agricultural Experiment Station  
Volume 9 Issue 8 August 2019



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



# CAES

The Connecticut Agricultural Experiment Station

*Putting Science to Work for Society since 1875*

## 109th

Plant Science  
Day—Lockwood  
Farm, Hamden,  
Wednesday, Au-  
gust 7, 2019

### This Issue

Grants Received	2
Administration	2
Analytical Chemistry	2
Entomology	3
Environmental Sciences	3
Forestry and Horticulture	4
Plant Pathology and Ecology	5
Valley Laboratory	6
Dept. Research Updates	7
Journal Articles Approved	9
Articles of Interest	10
New Staff, Students, and Volunteers	11

## GRANTS RECEIVED JULY 2019

**DR. JATINDER AULAKH** received a research grant (\$1000) from the Connecticut Christmas Tree Growers Association (CCTGA) for woody vine and shrub control in Christmas trees.

## ADMINISTRATION

**DR. THEODORE ANDREADIS** hosted a meeting at the Station with Dr. Indrajeet Chaubey, the new Dean of Agriculture, Health and Natural Resources from UCONN. Provided an overview of Station organization, funding, facilities, and research, surveillance and diagnostic programs and services with Dr. Jason White and Mr. Michael Last followed by a brief tour of several Departmental laboratories and visits with Scientific staff (July 12); was interviewed for a story about Plant Science Day and Lockwood Farm by Kathy Czepiel, Nutmeg Press (July 16); and was interviewed about current West Nile virus activity in the State and outlook for the remainder of the season by Amanda Cuda, Connecticut Post (July 30).

## ANALYTICAL CHEMISTRY

**DR. JASON C. WHITE** participated in a ZOOM call with collaborators at Johns Hopkins University to discuss joint research on nano-enabled agriculture (July 1); participated in the weekly all-hands ZOOM call for the Center for Sustainable Nanotechnology (CSN) (July 3, 10, 31); hosted the bi-weekly CSN Nanochem-plant working group ZOOM call (July 9); along with **DR. BRIAN EITZER, DR. WALTER KROL, MS. TERRI ARSENAULT, MR. CRAIG MUSANTE, AND MS. KITTY PRAPAYOTIN-RIVEROS**, participated in the monthly FDA FERN cCAP WebEx call (July 11); hosted the monthly meeting of the CAES J-1 Visa awardees (July 15); participated in a research workshop entitled "Nanotechnology in Sustainable Agriculture: Exploring Safe Pathways from the Laboratory to the Field" at McGill University and gave a lecture entitled "How to Manage the Risks of Nanotechnology in Agriculture" (50 attendees) (July 17-18); participated in the Proposal Defense of Mr. Ahmed Ali of the University of Massachusetts Amherst (he is on his PhD committee) (July 21); participated in a strategic planning meeting and writing session at the University of Minnesota as part of the CSN Phase IIB renewal application for the US NSF (July 23-25); met with Riccardo Posada of the University of New Haven regarding a potential fall research internship (July 30); attended the Governor's CT PFAS Taskforce meeting in Newington and joined the Human Health Committee (July 30); and participated in a monthly project update ZOOM call for the Nanyang Technological University-Harvard University TH Chan School of Public Health Initiative for Sustainable Nanotechnology (NTU-Harvard SusNano) (July 31).

**DR. BRIAN EITZER** was the leader of a session on pesticide analysis at the 56th Annual North American Chemical Residue Workshop held in Naples, FL (150 attendees) (July 21-24).

**DR. NUBIA ZUVERZA-MENA**, along with **DR. LINDSAY TRIPLETT**, gave a workshop on Formal and Informal Scientific Communication for the Plant Health and Protection (PHP Program) Fellows at Southern Connecticut State University, New Haven, CT (11 attendees) (July 8).

**DR. CHRISTINA ROBB** visited the FDA Forensic Chemistry Center in Cincinnati, OH to learn more about protein analysis by mass spectrometry (July 11th); and participated in a long range program planning meeting for the Eastern Analytical Symposium (July 26<sup>th</sup>).

## ENTOMOLOGY

**DR. KIRBY C. STAFFORD III** participated in a conference call about a tick academy coordinated by the Tick IPM Working Group (July 2); and was interviewed about gypsy moth by Patrick Skahill, WNPR Public Radio (July 12).

**DR. MEGAN LINSKE** participated in a Wildlife Society Leadership Institute (LI) mentorship planning call with current LI student Justin Shew (July 19); participated in a conference call with US Biologic to discuss further collaboration through ZooHub (July 23); and published "Impacts of Deciduous Leaf Litter and Snow Presence on Nymphal *Ixodes scapularis* (Acari: Ixodidae) Overwintering Survival in Coastal New England, USA" in *Insects* as part of the Special Issue Tick Surveillance and Tick-borne Diseases (July 30).

**DR. GALE E. RIDGE** was interviewed about lightning bugs and their high populations in Connecticut this year by Mark Zaretsky from the New Haven Register (July 25).

**DR. VICTORIA L. SMITH** participated in the summer meeting of the Connecticut Nursery and Landscape Association, held at Planters Choice Nursery in Monroe (approx. 200 participants) (July 17); participated in a meeting of the Yale Biosafety committee, held at 135 College Street, New Haven (20 participants) (July 18); participated in a career panel for the CAES Summer Intern program, directed by Lindsay Triplett, held in Jones Auditorium (15 participants) (July 22).

**DR. KIMBERLY A. STONER** was interviewed about bees and Pollinator Pathways by Julia Werth of the Connecticut Examiner (July 3); was interviewed about Pollinator Pathways by Susan Shea of Northern Woodlands Magazine (July 8); was photographed at Keeler Meadows, Wilton, with Mary Ellen Lemay, Louise Washer, and Donna Merrill, co-founders of the Pollinator Pathway movement for Connecticut Magazine (July 24); spoke on the topic, "What You Can Do to Help Bees" at a Teach-In on the Climate Crisis and Environment, sponsored by Together We Rise at St. Stephens Church in East Haddam (45 attendees) (July 27); consulted with Dina Brewster, Executive Director of CT NOFA, about equipment and information for harvesting and processing seed of native pollinator plants (July 30); and was interviewed on camera in the Urban Oasis on the CAES New Haven campus about factors in losses of honey bee colonies by Sam Kantrow of WTNH - 8 (July 30).

## ENVIRONMENTAL SCIENCES

**DR. JOSEPH PIGNATELLO** hosted and discussed research interests with Asst. Prof. Xitong Li, George Washington University (July 23); hosted and discussed research interests with Assoc. Prof. Yongbin Xie, Institute of Process Engineering, Chinese Academy of Sciences Division of Environmental Technology, Beijing, China (August 1).

**DR. PHILIP ARMSTRONG** spoke to the Connecticut Post (July 9), News Channel 3 (July 10 and July 25), and Fox 61 (July 24) about the detection of Jamestown Canyon virus in mosquitoes from Connecticut.

**MS. ANGELA BRANSFIELD** participated in the Federal Select Agent Program Responsible Official Workshop in Washington, D.C. (July 23-25).

**MR. GREGORY BUGBEE** spoke on "Brazilian Waterweed in Connecticut Lakes" at the annual meeting of the Staffordville Lake Association at the Stafford Springs Public Library (approx. 40 attendees)

(July 15); spoke on “Hydrilla in the Connecticut River” at a meeting on Riverfront Recapture in Hartford (12 attendees) (July 17); and spoke on “Control of Variable Watermilfoil and Fanwort with ProCellaCOR and Benthic Barriers” at the annual meeting of the Bashan Lake Association at the East Haddam Grange (approx. 60 attendees) (July 24).

**DR. ANDREA GLORIA-SORIA**, with Ms. Angela B. Bransfield, conducted an interactive outreach activity about mosquitoes and ticks at Tender Care Learning Center in Hamden (approximately 28 attendees, 22 children, 6 adults) (July 11).

**DR. GOUDARZ MOLAEI** spoke on “Passive Tick Surveillance and Testing Program: Tracking Ticks and Associated Pathogens in Connecticut” to the employees of Pitney Bowes in Shelton (20 attendees) (July 16); and was interviewed about tick bite prevention, tick removal, and tick-borne pathogen testing by New York Magazine (July 18).

**DR. SARA NASON** with Drs. Nubia Zuverza-Mena and Jason White, participated in a conference call regarding the CT Governor’s Taskforce on PFAS contaminants with CT Department of Public Health Deputy Commissioner Janet M. Brancifort and other DPH (July 15); and with Drs. Nubia Zuverza-Mena and Jason White, attended the first meeting of the Connecticut Interagency PFAS Task Force at the Connecticut Department of Transportation (July 30).

**MR. JOHN SHEPARD** spoke about mosquito trapping techniques to reporters from WTNH (Channel 8), WFSB (Channel 3), WTIC (Fox 61), and Amanda Cuda (CT Post) (June 3); spoke about the State Mosquito Trapping and Arbovirus Surveillance Program to students from Quinnipiac University (5 students, 2 faculty) (June 12) ; and Central Connecticut State University (17 students , 1 faculty) (June 20); was interviewed by CT Post about mosquito trapping collection and Jamestown Canyon virus (June 18); participated in a regional conference call (DE, MA, NJ, NY and PA) and gave a summary of mosquito trapping and arbovirus surveillance data (July 12); and was interviewed about Mosquito Trapping and Testing results by CT Post (July 16).

## FORESTRY AND HORTICULTURE

**DR. JEFFREY S. WARD** was interviewed about the influence of wet May and June on spread and growth of invasive plants by Robert Miller of the Danbury News-Times (July 2); met with Alex Amendola and Josh Tracy (Regional Water Authority) to discuss control of invasive bamboo (July 5); was interviewed about prescribed burning by Hanna Holcomb of Connecticut Woodlands (July 11); attended the Connecticut Tree Protective Association summer meeting in Farmington (July 18); met with Louis Nichole in Prospect to discuss cultural care of large trees (July 22); and participated in the NESAF 2020 planning committee conference call (July 30).

**DR. ABIGAIL A. MAYNARD** reported on Station activities at a quarterly meeting of the Council on Soil and Water Conservation in Middletown (16 adults) (July 11); discussed the New Crops Program

at Hindingers Farm in Hamden (July 15); discussed the New Crops Program with 5 growers at the Farmers Market in Middletown (July 19); assisted Wesleyan University students with their composting operation in Middletown (3 students, 1 teacher) (July 25); and discussed the New Crops Program with 4 growers at the Farmers Market in Hamden (July 25).

**DR. SCOTT C. WILLIAMS** participated in a conference call for the Northeast Regional Center for Excellence in Vector-Borne Diseases (July 23); participated in a conference call with US Biologic, Inc. (July 23); and spoke to interns with the South Central Connecticut Regional Water Authority about vector-borne disease ecology research, North Branford (July 30).

**MR. JOSEPH P. BARSKY** staffed CAES booth at the Connecticut Tree Protective Association summer meeting held in Farmington (July 18); and participated in NESAF 2020 planning committee conference call (July 30).

## PLANT PATHOLOGY AND ECOLOGY

**DR. DONALD E. AYLOR** presented two invited lectures at the International Conference on Fluids Dynamics of Disease Transmission and Plant and Human Health held in Cargese, Corsica, France on July 28 - August 3, 2019, entitled: (1) "The Biophysics of Plant Pathogenic Spore Interactions with Atmospheric Turbulence in Plant Canopies" (July 30) and (2) "Atmospheric Dispersal of Plant Pathogens Over Multiple Spatial and Temporal Scales" (43 attendees) (July 31) .

**DR. WADE ELMER** assisted in organizing a greenhouse grower meeting in Jones Auditorium on July 11 on "Water & Nutrient Management in Container Production" with Dr. Rosa Raudales and Ms. Leanne Pundt (75 attendees) (July 11); attended the Connecticut Nursery and Landscape Association summer meeting held in Watertown (July 17); and presented a talk on "Soil Health" at a SARE workshop on "Nutrition's Role In Sustainable Livestock Production Practices 2019" held at Auer Farm in Bloomfield (23 attendees) (July 19).

**DR. YONGHAO LI** attended the CCTGA Board Meeting and discussed a research proposal in Meriden (20 adults) (July 10); presented a talk entitled "Boxwood Blight" at the CNLA Summer Meeting held in Watertown (60 adults) (July 17); staffed the CAES booth at the CTPA Summer Meeting held in Farmington (July 18); presented "Plant Pathologist/Diagnostician" in the Career Panel on Regulatory/Government Science as a part of the summer internship program held in New Haven (13 adults) (July 22); and talked about "Needle Cast Diseases of Douglas Fir and Fungicide Treatment" at the CCTGA Twilight Meeting held in Westport (20 adults) (July 31).

**DR. ROBERT MARRA** joined other CAES staff in the CAES booth at the CTPA summer meeting held at the Farmington Club in Farmington (650 attendees) (July 18).

**DR. LINDSAY TRIPLET**, along with **DR. NUBIA ZUVERZA** led a science communication training workshop in the PPE conference room for 10 undergraduate interns (10 students) (July 8); led summer undergraduate students on a tour of Indigo, a biological products company in Boston, MA; the students toured the different steps of the Research and Development pipeline (10 students) (July 15).



Dr. Wade Elmer presenting talk on “Soil Health” at the CT Nursery and Landscape meeting

## VALLEY LABORATORY

**DR. JATINDER AULAKH** was interviewed about hogweed distribution in CT and chemical and non-chemical options for its control by Amanda Cuda from The Connecticut Post (July 16); and spoke about “Late summer and early fall weed management in Christmas trees” at the CCTGA twilight meeting held in Westport (14 attendees) (July 31).

**DR. RICHARD COWLES** discussed “Managing Christmas tree insects and diseases” to the Massachusetts Christmas Tree Growers’ Association in Plainfield, MA (35 attendees) (July 13); and discussed “Douglas-fir needle midge and advances in establishing bare root transplants” at the Connecticut Christmas Tree Growers’ Association twilight meeting held in Westport (14 attendees) (July 31).

**ROSE HISKES**, with Jim Preste, staffed an information table in the CNLA Discovery and Education gardens at the Valley Laboratory during the Windsor Garden Club Garden Tour. (~100 attendees) (July 13); staffed the CAES booth at the Connecticut Tree Protective Association summer meeting held at the Farmington Club in Farmington (July 18); and answered prepared and impromptu questions from Seabury residents as we toured their community garden plots in Bloomfield. The tour was videotaped and is on YouTube (15 participants) (July 30).

**DR. JAMES LAMONDIA** spoke about “The importance of cultivar testing for boxwood blight resistance or susceptibility” and “Fungicide effects on the boxwood blight pathogen” during the AmericanHort Cultivate19 meeting held in Columbus, OH (approx. 40-50 people) (July 15).

## DEPARTMENTAL RESEARCH UPDATES JULY 2019

Barandun, Jonas, Hunziker, M., Vossbrinck, C.R., Klinge, S. 2019 Evolutionary compaction and adaptation visualized by the structure of the dormant microsporidian ribosome, *Nature Microbiology* doi.org/10.1038/s41564-019-0514-6.

**Abstract**- Microsporidia are eukaryotic parasites that infect essentially all animal species, including many of agricultural importance<sup>1-3</sup>, and are significant opportunistic parasites of humans<sup>4</sup>. They are characterized by having a specialized infection apparatus, an obligate intracellular lifestyle<sup>5</sup>, rudimentary mitochondria and the smallest known eukaryotic genomes<sup>5-7</sup>. Extreme genome compaction led to minimal gene sizes affecting even conserved ancient complexes such as the ribosome<sup>8-10</sup>. In the present study, the cryo-electron microscopy structure of the ribosome from the microsporidium *Vairimorpha necatrix* is presented, which illustrates how genome compaction has resulted in the smallest known eukaryotic cytoplasmic ribosome. Selection pressure led to the loss of two ribosomal proteins and removal of essentially all eukaryote-specific ribosomal RNA (rRNA) expansion segments, reducing the rRNA to a functionally conserved core. The structure highlights how one microsporidia-specific and several repurposed existing ribosomal proteins compensate for the extensive rRNA reduction. The microsporidian ribosome is kept in an inactive state by two previously uncharacterized dormancy factors that specifically target the functionally important E-site, P-site and polypeptide exit tunnel. The present study illustrates the distinct effects of evolutionary pressure on RNA and protein-coding genes, provides a mechanism for ribosome inhibition and can serve as a structural basis for the development of inhibitors against microsporidian parasites.

Cao, X., Xiao, F., Duan, P., Pignatello, J.J., Mao, J., Schmidt-Rohr, K.\* 2019. Effects of Post-Pyrolysis Air Oxidation on the Chemical Composition of Biomass Chars Investigated by Solid-State Nuclear Magnetic Resonance Spectroscopy, *Carbon* 153: 173-178. doi.org/10.1016/j.carbon.2019.07.004

**Abstract**- Solid-state nuclear magnetic resonance (NMR) spectroscopy was used to characterize the chemical changes induced by thermal air oxidation of biomass chars. Post-pyrolysis air oxidation (PPAO) was applied to anoxically-prepared maple wood and pecan shell chars at PPAO temperatures ranging from 300 to 600 °C for up to 40 min. The <sup>13</sup>C NMR data showed that PPAO treatment introduced oxygen functionalities into aromatic rings, primarily C-O and C=O, but also carboxyl groups (COO) identified after spectral editing. The concentration of COO was relatively low (<3% of all C), consistent with potentiometric titration, and reached a discernable maximum at 300 °C. The COO enhancement from PPAO was lower than observed after wet-chemical oxidation with HNO<sub>3</sub> or ammonium persulfate. Concentrations of the C-O and C=O groups reached a maximum at PPAO temperatures between 350 and 400 °C, and decreased at higher temperatures. These oxygen-containing functional groups were shown to generally increase with increasing PPAO time. Insight into the types and concentrations of oxygen functional groups induced by exposure of biomass chars to hot air has major implications for an understanding of the interaction of char with nutrients, natural organic matter, pollutants, and microbes, as well as electron transfer processes in soil.

Cui, Z., Yang, C.H., Kharadi, R.R., Yuan, X., Sundin, G.W., Triplett, L. R., Wang, J., and Zeng, Q. 2019. Cell-length heterogeneity: a population-level solution to growth/virulence trade-offs in the plant pathogen *Dickeya dadantii*. *PLOS Pathogens* 2019 15(8):e1007703. doi: 10.1371/journal.ppat.1007703.

**Abstract** - Necrotrophic plant pathogens acquire nutrients from dead plant cells, which requires the disintegration of the plant cell wall and tissue structures by the pathogen. Infected plants lose tissue integrity and functional immunity as a result, exposing the nutrient rich, decayed tissues to the environment. One challenge for the necrotrophs to successfully cause secondary infection (infection spread from an initially infected plant to the nearby uninfected plants) is to effectively utilize nutrients released from hosts towards building up a large population before other saprophytes come. In this study, we observed that the necrotrophic pathogen *Dickeya dadantii* exhibited heterogeneity in bacterial cell length in an isogenic population during infection of potato tuber. While some cells were regular rod-shape (<10µm), the rest elongated

into filamentous cells (>10µm). Short cells tended to occur at the interface of healthy and diseased tissues, during the early stage of infection when active attacking and killing is occurring, while filamentous cells tended to form at a later stage of infection. Short cells expressed all necessary virulence factors and motility, whereas filamentous cells did not engage in virulence, were non-mobile and more sensitive to environmental stress. However, compared to the short cells, the filamentous cells displayed upregulated metabolic genes and increased growth, which may benefit the pathogens to build up a large population necessary for the secondary infection. The segregation of the two subpopulations was dependent on differential production of the alarmone guanosine tetraphosphate (ppGpp). When exposed to fresh tuber tissues or freestanding water, filamentous cells quickly transformed to short virulent cells. The pathogen adaptation of cell length heterogeneity identified in this study presents a model for how some necrotrophs balance virulence and vegetative growth to maximize fitness during infection.

Li, D., Schultes, N., LaMondia, J., and Cowles, R.S. 2019. *Phytophthora abietivora*, a new species isolated from diseased Christmas trees in Connecticut, USA. Plant Disease <https://doi.org/10.1094/PDIS-03-19-0583-RE>

**Abstract** A number of fir species, (*Abies* spp.), are produced as Christmas trees around the world. In particular, the Fraser fir, *Abies fraseri* (Pursh) Poir., is popular as it yields high-quality Christmas trees in temperate North America and Europe. A *Phytophthora* sp. causing root rot on Fraser fir was isolated from a Christmas tree farm in Connecticut, USA, and found to be new to science according to morphological and molecular phylogenetic analysis using multi-locus DNA sequences from ITS, Cox1, β-Tub, Nadh1, and Hsp90 loci. Thus, it was described and illustrated as *Phytophthora abietivora*. An informative Koch's postulates test revealed that *P. abietivora* was the pathogen causing root rot of Fraser fir.

Linske, M. A., Stafford III, K.C., Williams, S.C., Lubelczyk, C.B., Welch, M., Henderson, E.F. 2019. Impacts of Deciduous Leaf Litter and Snow Presence on Nymphal *Ixodes scapularis* (Acari: Ixodidae) Overwintering Survival in Coastal New England, USA. *Insects* 10 (8): 227. doi: 10.3390/insects10080227.

**Abstract-** Blacklegged ticks (*Ixodes scapularis* Say) are the vector for pathogens that cause more cases of human disease than any other arthropod. Lyme disease is the most common, caused by the bacterial spirochete *Borrelia burgdorferi* (Johnson, Schmid, Hyde, Steigerwalt, and Brenner) in the northeastern United States. Further knowledge of seasonal effects on survival is important for management and modeling of both blacklegged ticks and tick-borne diseases. The focus of our study was on the impact of environmental factors on overwintering success of nymphal blacklegged ticks. In a three-year field study conducted in Connecticut and Maine, we determined that ground-level conditions play an important role in unfed nymphal overwintering survival. Ticks in plots where leaf litter and snow accumulation were unmanipulated had significantly greater survival compared to those where leaf litter was removed ( $p = 0.045$ ) and where both leaf litter and snow were removed ( $p = 0.008$ ). Additionally, we determined that the key overwintering predictors for nymphal blacklegged tick survival were the mean and mean minimum temperatures within a year. The findings of this research can be utilized in both small- and large-scale management of blacklegged ticks to potentially reduce the risk and occurrence of tick-borne diseases.

Rodrigues, F. A., Einhardt, A. M., Rios, J. A. Silveira, P. R., Elmer, W. H., and Datnoff, L. E. 2019. Nutrição mineral no manejo das doenças de plantas. In *Nutrição e Adubação de Grandes Culturas Na Região do Cerrado*, eds. R. A Flores, P. P. da Cunha, R. L Marchão, and M. F. Moraes, Gráfica UFG. Pp. 38-76.

**Abstract-** Chapter 2 in the book *Nutrição e Adubação de Grandes Culturas Na Região do Cerrado* (Nutrition and Fertilization of Large Crops In the Cerrado Region). This chapter summarizes the role of mineral nutrition in relation to plant disease. Each essential and beneficial element is discussed (Portuguese).



Uraki, R., Hastings, A.K., Brackney, D.E., Armstrong, P.M., Fikrig, E. 2019. AgBR1 antibodies delay lethal *Aedes aegypti*-borne West Nile virus infection in Mice. *NPJ Vaccines* 8; 4:23.

**Abstract-** West Nile virus (WNV) is transmitted by mosquitoes and can cause severe disease, including meningoencephalitis. AgBR1 is a mosquito salivary protein that enhances *Aedes aegypti* mosquito-borne Zika virus pathogenesis in mice. Here, we show that AgBR1 antibodies reduce the initial West Nile viral load and delay lethal infection after feeding by an infected *Aedes aegypti* mosquito. Targeting AgBR1 may therefore be incorporated into strategies to prevent mosquito-transmitted West Nile virus infection.

## JOURNAL ARTICLES APPROVED JULY 2019

**Adisa, Ishaq, S. Rawat, V. L. R. Pullagurala, C. O. Dimkpa, Wade H. Elmer, Jason C. White, J. R. Peralta-Videa, and J. L. Gardea-Torresdey.** Nutritional Status of Tomato (*Solanum lycopersicum*) Fruit Grown in Fusarium-Infested Soil: Impact of Cerium Oxide Nanoparticles. *NanoImpact*

Eastwood, G., A. K. Donnellycolt, **John J. Shepard, Michael J. Misencik, R. Bedoukian, L. Cole, Philip M. Armstrong, and Theodore G. Andreadis.** Evaluation of Novel Trapping Lures for Monitoring Exotic and Native Container-Breeding *Aedes* spp. [Diptera: Culicidae) Mosquitoes. *Journal of Medical Entomology*

**Gloria-Soria, Andrea, S. Mendiola, V. J. Morley, B. Alto, and P. E. Turner.** Prior Evolution in Stochastic Versus Constant Temperatures Affects RNA Virus Evolvability at a Thermal Extreme. *Proceedings of the Royal Society B*

Imperiale, D., G. Lencioni, M. Marmioli, A. Zappettini, **Jason C. White, and N. Marmioli.** Zn and Cd Hyperaccumulation in Ionic and Nanoscale Form. *Environmental Science & Technology*

Marmioli, M., G. Orazio Lepore, L. Pagano, F. d'Acapito, A. Gianoncelli, M. Villani, **Jason C. White, and N. Marmioli.** The Fate of CdS Quantum Dots in Plants as Revealed by Extended X-ray Absorption Fine Structure (EXAFS) Analysis. *Environmental Science & Technology*

Pokutnaya, Darya, **Goudarz Molaei, D. M. Weinberger, and Alexander J. Diaz.** Prevalence of Infection and Co-Infection and Status of Rickettsia Endosymbionts in *Ixodes scapularis* (Acari: Ixodidae). *Journal of Parasitology*

Rochlin, I., A. Faraji, K. Healy, and **Theodore G. Andreadis.** West Nile Virus Mosquito Vectors in North America. *Journal of Medical Entomology*

Tippery, N. P., **Gregory J. Bugbee, and Summer E. Stebbins.** Evidence for a Genetically Distinct Strain of Introduced *Hydrilla verticillata* (Hydrocharitaceae) in North America. *Journal of Aquatic Plant Management*

Yuan, X., **Quan Zeng, J. Xu, G. B. Severin, X. Zhou, C. M. Waters, G. W. Sundin, A. M. Ibekwe, F. Liu, and C.-H. Yang.** Tricarboxylic Acid (TCA) Cycle Enzymes and Intermediates Modulate Intracellular Cyclic di-GMP Levels and the Production of Plant-Cell-Wall Degrading Enzymes in Soft Rot. *Molecular Plant Microbe Interactions*

## ARTICLES OF INTEREST JULY 2019

DR. DAVID E. HILL TRIBUTE (by Dr. Abigail Maynard)

APRIL 26, 1929 - AUGUST 8, 2019

When Dr. David E. Hill started at the Station fifty years ago, June 28, 1957 to be exact, he only planned to stay for a year. Dave had just finished his PhD at Rutgers and had intended to return there to teach. When the invitation to return came as expected, he turned it down because he had fallen in love with Connecticut. Over fifty years later, though officially retired, you could still find him every day at Lockwood Farm tending his crops.



Dave did not start his career at the Station growing crops at Lockwood Farm. He spent his early years at the Valley Lab in Windsor working on the State Soil Survey and was coauthor of the first three county surveys. His specialty was interpreting soil survey information, especially concerning sanitary facilities. He was transferred to New Haven in 1966 after his work with the Soil Survey ended.

Dave's work with soils did not end with his move to New Haven. He completed an extensive study of Connecticut and Rhode Island's tidal marshes and the resulting Station bulletin is still requested. His research also included the movement of water and nutrients through the soil (fingers) that continues to be cited.

Dave's career changed when he was asked to assist in the Day-Waverly community garden in New Haven's inner city. Because the soil was poor, Dave established a demonstration plot in the community garden where he tried different methods to improve the soil with various soil amendments. This led to research at Lockwood Farm investigating various mulches and their effect on vegetable yields. In 1982, Dave was asked to head the Station's New Crops Program. For the next 25 years, he studied over 35 fruits and vegetables, many of which had never before been grown in Connecticut. Many growers learned how to grow specialty crops like globe artichokes, Belgium endive, and jilo from his research.

Why did Dave still come out to Lockwood Farm day after day even after retirement? He simply loved to grow things and everyone who met him could not help but be affected by his enthusiasm. He was considered the vegetable expert at the Station. Growers respected him not only for his knowledge but because they knew that he, like them, had been out there living with the crops day after day. He always had time for visitors at the farm and loved to explain about the particular plot he was working on. Quite simply, Dave represented the best of the Station: loyal, dedicated, well-informed, hard-working, all with a friendly demeanor. Indeed, Connecticut is fortunate that Dave made that decision to stay all those years ago.





**Dr. Stephen Taerum** is a postdoctoral fellow from Calgary, Canada, with a strong interest in the evolution and ecology of symbiotic interactions. He is working with Lindsay Triplett and Blaire Stevens to study the diversity and ecology roles of protists that are present in the rhizomes of maize. Prior to joining CAES, Stephen completed a postdoctoral position at Arizona State University, where he studied the evolution and taxonomy of protists associated with termites and cockroaches. He obtained his PhD at the Forestry and Agricultural Biotechnology Institute at the University of Pretoria in South Africa, where he studied the global movement histories of red turpentine beetles and their fungal associates. In his spare time, he enjoys biking, going to the gym, and Krav Maga.



Plant Pathology & Ecology undergraduate interns



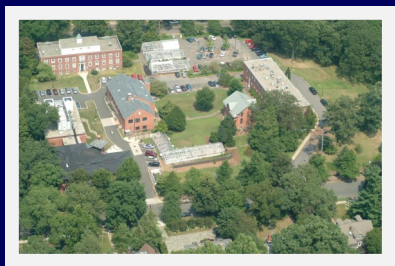
# CAES

The Connecticut Agricultural Experiment Station

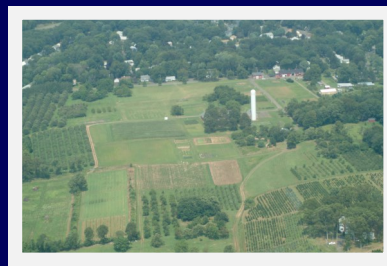
*Putting Science to Work for Society since 1875*

## The Connecticut Agricultural Experiment Station

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



Griswold Research Center, Griswold



Valley Laboratory, Windsor

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

Putting Science to  
Work for Society.

## The Connecticut Agricultural Experiment Station

Back and Current issues of Station News are located on our website at <https://portal.ct.gov/CAES/Publications/Publications/Station-News>

The Connecticut Agricultural Experiment Station (CAES) prohibits discrimination in all of its programs and activities on the basis of race, color, religious creed, age, sex, marital status, veteran status, sexual orientation, gender identity, gender expression, national origin, ancestry, criminal conviction record, genetic information, learning disability, present or past history of mental disability, intellectual or physical disability, including, but not limited to blindness, of an applicant for employment or an employee, unless the mental disability or physical disability prevents adequate performance. To file a complaint of discrimination, contact Dr. Jason White, Vice Director, The Connecticut Agricultural Experiment Station, P.O. Box 1106, New Haven, CT 06504, (203) 974-8523 (voice), or [Jason.White@ct.gov](mailto:Jason.White@ct.gov) (e-mail). CAES is an affirmative action/equal opportunity provider and employer. Persons with disabilities who require alternate means of communication of program information should contact the Chief of Services, Michael Last at (203) 974-8442 (voice), (203) 974-8502 (FAX), or [Michael.Last@ct.gov](mailto:Michael.Last@ct.gov) (e-mail).



<https://portal.ct.gov/CAES>

Volume 9 Issue 8  
August 2019

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