

Station News

The Connecticut Agricultural Experiment Station
Volume 10 Issue 4 April 2020



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

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GRANTS RECEIVED MARCH 2020

DR. SANDRA ANAGNOSTAKIS (Emeritus) was awarded a grant from the Hartford Foundation in March to assist in the maintenance of the chestnut trees at Lockwood Farm and for scanning and digitizing the USDA importation cards for chestnut, which were formerly stored in the Osborne Library.

ADMINISTRATION

DR. JASON C. WHITE participated in a ZOOM call for the Center for Sustainable Nanotechnology (CSN) to select candidates for the Summer Undergraduate Research Experience (SURE) Program (March 2); participated in FDA FERN WebEx calls regarding analytical assignments for the upcoming Republican/Democratic National Conventions and the Inauguration (March 3, 10, 24); attended the Second Pan-American Nanotechnology Conference held in Aguas de Lindoia, Brazil, and gave an invited keynote presentation entitled “Nanotechnology in Agriculture: Balancing crop protection and food safety” (50 attendees) (March 3-8); hosted the CSN monthly Nanochem-Plant working group call (March 10); participated in a ZOOM call with Prof. Howard Fairbrother of Johns Hopkins University regarding a collaborative USDA grant proposal (March 10); participated in the weekly CSN center-wide ZOOM call (March 11, 18, 25); along with **DR. NUBIA ZUVERZA-MENA** and **DR. SARA NASON**, participated in a ZOOM call with collaborators at the Yale University School of Public Health regarding a collaborative grant proposal (March 12, 24); participated in the monthly FDA FERN cCAP WebEx call (March 12); participated in a ZOOM call with collaborators at Louisiana State University and the University of Auckland regarding a collaborative grant (March 12); hosted the CAES monthly J-1 Visa recipients meeting (March 13); participated in an FDA 50-state WebEx call (March 19); participated in NERA ZOOM calls (March 24, 30); hosted the CAES Safety Committee quarterly meeting (March 27); hosted a ZOOM call with the California Department of Public Health regarding FDA FERN work (March 27); and hosted a ZOOM call with collaborators at the University of Delaware regarding collaborative work (March 31).



Dr. Jason C. White giving a presentation at the Second Pan-American Nanotechnology Conference in Aguas de Lindoia, Brazil.

ANALYTICAL CHEMISTRY

DR. BRIAN D. EITZER was a participant in the laboratory cannabis potency analysis call (March 6); judged the CT Science and Engineering Fair via a ZOOM call (March 10-11); participated in a conference call of the North American Chemical Residue Workshop’s Organ-

izing Committee (March 12), the monthly FDA FERN cCAP call (March 12), and the APHL’s Cannabis Community of Practice monthly conference call (March 26).

DR. WALTER KROL, MS. KITTY PRAPAYOTIN-RIVEROS, and MS. TERRI ARSENAULT presented a CAES Seminar entitled “Food Safety and ISO 17025 Accreditation” in the Jones Auditorium (March 4); with **DR. BRIAN EITZER and MS. TERRI ARSENAULT**, met with Brian Quinn from Sweet Heal to evaluate a Photonics Lightlab Cannabis analyzer (March 6).

MS. KITTY PRAPAYOTIN-RIVEROS participated in the Sample Analysis Data Exchange - IT Implementation Phase Meeting on WebEx to discuss the NFSDX (National Food Safety Data Exchange) phase II Sample Data Elements Mapping File (March 17).

DR. CHRISTINA ROBB participated in the monthly FDA FERN cCAP WebEx call (March 12); attended the Flexible Funding Model Cooperative Agreement and the Animal Feed Regulatory Program Standards Cooperative Agreement meeting (March 27); and participated in the Eastern Analytical Symposium (EAS) long range planning committee meeting (March 31).

ENTOMOLOGY

MS. KATHERINE DUGAS taught an Advanced Master Gardener course on insect taxonomy and identification at the Litchfield Cooperative Extension office (15 attendees) (March 9).

DR. MEGAN LINSKE gave a presentation at entitled “New Ticks Rising: Developments in Ticks and Tick-Borne Diseases” at the Forest Health Monitoring Workshop held in Jones Auditorium (60 attendees) (March 5); and was elected President-Elect of the Northeast Section of The Wildlife Society (March 25).

DR. GALE E. RIDGE was notified by Hannah Halfpenny, producer of “Me Myself and Everyone Else,” a mental health podcast out of Scandinavia, that her work with sufferers of Delusions of Infestations in the United States had been highlighted in her Delusions of Parasitosis broadcast and attended the New Jersey Mosquito Control Association annual conference held in Cape May, NJ, where she gave a talk about Delusions of Parasitosis (March 4-6).

DR. CLAIRE E. RUTLEDGE gave a presentation entitled “Progress in Emerald Ash Borer Biological Control” at the annual Forest Health Monitoring Workshop held in Jones Auditorium (60 participants) (March 5).

DR. VICTORIA L. SMITH organized and participated in the annual Forest Health Monitoring Workshop held in Jones Auditorium (60 participants) (March 5). There were 8 presentations on topics ranging from progress in EAB, new ticks in CT, beech leaf disease, and effects of forest mast on wildlife, and one discussion about the general health of CT forests. Presentations are archived on the CAES website at <https://portal.ct.gov/CAES/Publications/Publications/Forest-Health-Monitoring-Workshop-2020>. The next workshop is scheduled for March 4, 2021.

DR. KIMBERLY A. STONER met with the Right of Way Working Group of the Connecticut Botanical Society to plan an event and create documents for the upcoming workshop, “Advocating for the Biological Value of Your Local Right of Way” in Cheshire (8 participants) (March 2); met via Zoom with organizers of the Pollinator Pathway network, Sam Droege of

the US Geological Survey, and Jim Sirch of the Peabody Museum about Citizen Science projects in which Pollinator Pathway members could participate (9 participants) (March 9); and organized, hosted, and spoke in a workshop entitled "Advocating for the Biological Value of Your Local Right of Way" in Jones Auditorium, and by Zoom (29 participants) (March 12). Materials from the workshop were also shared with the Connecticut Land Conservation Council on their website and through their listserv.

ENVIRONMENTAL SCIENCES

DR. JOSEPH PIGNATELLO participated in conference calls with faculty at Villanova University, Pacific Northwest National Laboratory, and Oregon Health and Science University regarding an ongoing research project (March 27, 30); and received the 2019 Soil Science Society of America Journal (SSSAJ) Outstanding Associate Editor Award (March 24).

DR. PHILIP ARMSTRONG gave a talk entitled "Mosquito Surveillance for EEE and Other Arboviruses" at the Symposium on Mosquito-borne Diseases in Connecticut held in Jones Auditorium (60 attendees) (March 9).

MS. ANGELA BRANSFIELD participated in the Federal Select Agent Program's webinar, "eFSAP Information System March 2020 Release Updates" (March 23).

MR. GREGORY BUGBEE provided expert testimony before the Environment Committee regarding changes needed in the Lake Beseck winter drawdown legislation Sec. 22a-39h (February 21); gave a talk entitled "Container Gardening Indoors and Out" at the East Hartford Public Library (approx. 12 attendees) (March 9); gave a talk entitled "Container Gardening Indoors and Out" to the Cherry Brook Garden Club at the Community Center in Canton (approx. 65 attendees) (March 10); and, with **MS. SUMMER STEBBINS** gave a talk entitled "Surveillance and Mapping of Invasive Plants in the Lower Connecticut River" via teleconferencing to the Gateway Commission (approx. 15 attendees) (March 26).

DR. SARA NASON coached science fair students at the Sound School, New Haven, and had students participate in the online CT State Science Fair (March 5, 9-13); and participated in a video conference call with **DR. JASON WHITE** and **DR. NUBIA ZUVERZA-MENA** at CAES and researchers at NIH, Yale, and the University of Minnesota regarding a proposal for a collaborative phytoremediation project (March 30).

MR. JOHN SHEPARD gave a lecture entitled "Eastern Equine Encephalitis Virus in Connecticut" to Dr. Kirsten Martin's Environmental Health class at the University of St. Joseph in West Hartford (10 students, 1 faculty) (March 2); gave two invited talks entitled "Mosquito-Borne Viruses in Connecticut" and "Biology, Ecology, and Feeding Behavior of Mosquitoes in Connecticut" at a Mosquito and Biting Fly Training Workshop held at CAES and sponsored by Central Turf & Irrigation (105 attendees) (March 3); and gave a talk entitled "Biology, Ecology, and Feeding Behavior of Mosquitoes in Connecticut" at a Symposium on EEE and Other Mosquito-Borne Diseases in Connecticut held in Jones Auditorium for local public health officials (58 attendees) (March 9).

FORESTRY AND HORTICULTURE

DR. JEFFREY S. WARD participated in an NESAF 2020 planning committee conference call (March 3); participated in a Forest Ecosystem Monitoring Cooperative conference call to discuss a regional forest health monitoring network (March 4); spoke on "Drought, Defoliation, and Death" at the 24th annual Forest Health Monitoring Workshop held in Jones Auditorium (40 attendees) (March 5); spoke on "A short history of the Connecticut Forest" for the Madison Garden Club (32 attendees) (March 10); participated in an NESAF 2020 planning committee conference call (March 10); administered practical and oral examination to arborist candidates for the Connecticut Tree Protection Examining Board

(March 11); participated in Yankee SAF, Forest Management and Carbon Task Force conference calls (March 17, 27).

DR. ABIGAIL A. MAYNARD spoke on “Composting and Utilization of Compost” to the Garden Club of New Haven in Jones Auditorium (72 adult attendees) (March 2); discussed the New Crops program with Tom Sheil in Milford (March 4); and was interviewed about the effects of the early spring on agriculture by Kathy Czepiel of the Daily Nutmeg (March 19).

DR. SCOTT C. WILLIAMS was interviewed by CT NBC-30 reporter Siobhan McGir about the newly discovered Asian longhorn tick and tick ecology and climate <https://www.nbcconnecticut.com/news/local/first-statewide-tick-study-finds-lyme-disease-in-half-of-all-deer-ticks-collected/2232662/> (March 3); gave a talk entitled “Connecticut Oak Mast Drives Tick, Disease Reservoir, and Bird of Prey Abundances” at the Forest Health Monitoring Workshop held in Jones Auditorium (60 attendees) (March 5).

MR. JOSEPH P. BARSKY participated in an NESAF 2020 planning committee conference call (March 10); participated in a New England Society of American Foresters Executive Committee conference call (March 24).

PLANT PATHOLOGY AND ECOLOGY

DR. WADE H. ELMER teleconferenced a presentation entitled “Engineered mesoporous silica nanoparticles for plant health” to the Annual Meeting of the Northeastern Division of the American Phytopathological Society (March 9); and teleconferenced with The American Phytopathological Society Press for their quarterly meeting (March 31).

DR. YONGHAO LI presented “Notifiable Tree Diseases” at the Forest Health Monitoring Workshop held in Jones Auditorium (60 adult attendees) (March 5); presented “The National Plant Diagnostic Network, Online Communications and Web Portal Committee Updates” and “Connecticut Plant Disease Updates” at the Northeast Plant Diagnostic Network Meeting (remotely) (23 adult attendees) (March 10); presented “What’s Wrong with My Plant and How to Prevent It” at the Northeast Organic Farming Association Winter Conference held in Middletown (22 adult attendees) (March 7).

DR. ROBERT E. MARRA gave a presentation entitled “Beech Leaf Disease, Oak Wilt, and Introducing the Forest Ecosystem Monitoring Cooperative” at the Forest Health Monitoring Workshop held in Jones Auditorium (60 adults) (March 5).

VALLEY LABORATORY

DR. CAROLE CHEAH gave a tour of the HWA biocontrol site at Salmon River State Forest and the Valley Laboratory insectary for biological control rearing of *Sasajiscymnus tsugae* (February 20); and was interviewed by Todd McLeish for an article in Connecticut Magazine on biological control (February 21); gave a presentation on the recovery of eastern hemlocks at the 2020 Forest Health Monitoring Workshop held in Jones Auditorium (60 attendees) (March 5); and was interviewed on the recovery of eastern hemlocks in CT by Robert Miller for the Danbury News-Times (March 24).

DR. RICHARD COWLES discussed “Bagworms, scales, and Zimmerman pine moths” in one presentation, and “Christmas tree fertility basics” to the Connecticut Christmas Tree Growers’ Association annual meeting held in Middletown (70 attendees) (March 7).

MS. ROSE HISKES participated in a virtual Connecticut Invasive Plant Working Group symposium planning committee meeting. (March 23).

DR. JAMES LAMONDIA taught a class on identification, biology, and management of tree diseases to students in the Connecticut Tree Protective Association's Arboriculture 101 class held in Wallingford (39 attendees) (March 4); with **DR. RICHARD COWLES**, met with Westfield State University student Joseph Braun to discuss his undergraduate senior research project (March 9); and conducted oral exams for candidates for the Connecticut arborist license and participated in the quarterly meeting of the Connecticut Tree Protection Examining Board held at the Station (March 11).

DEPARTMENTAL RESEARCH UPDATES MARCH 2020

Allan-Perkins, E., Li, D., Schultes, N., Yavuz, S., LaMondia, J. The identification of a new species, *Diaporthe humulicola*, a pathogen causing Diaporthe Leaf Spot on common hop. Plant Disease. Plant Disease doi.org/10.1094/PDIS-08-19-1770-RE

Abstract - Common hop, *Humulus lupulus*, is a commercially important crop in the United States, with an increasing number of hop yards being established in the Northeast. In 2018, a new fungal disease was observed at two research hop yards in Connecticut. This new pathogen affected all hop cultivars being grown and caused leaf spots and browning of cones. The causal organism was isolated, and Koch's postulates were performed to confirm pathogenicity. The disease symptoms were similar to the previously described Phoma wilt, however morphological and phylogenetic analyses placed the causal organism as a new species of *Diaporthe*. We propose the name *Diaporthe humulicola*. The disease increased under hot, humid conditions (around 24°C and 90% RH), which prevail during the summer in the Northeastern United States, as well as other parts of the country. An *in vitro* preliminary assessment of fungicide sensitivity revealed pyraclostrobin and boscalid inhibited *D. humulicola* growth in culture and should be further assessed for field efficacy against this new disease of hop. The proper identification and monitoring of this pathogen will be important to inform hop growers of this new threat.

Borges, D. F., Preising, S., Ambrósio, M. M. de Q., and da Silva, W. L. 2020. Detection of multiple grapevine viruses in New England vineyards. Crop Prot. 132:105143 Available at: <http://www.sciencedirect.com/science/article/pii/S0261219420300764>.

Abstract-Vineyards in the New England region of the USA were surveyed for the occurrence of grapevine viruses. A total of ten vineyards were visited and 62 composite samples of leaves with the petioles were collected from symptomatic grapevines (*Vitis* spp.). All of the samples were assayed by double-antibody sandwich enzyme-linked immunosorbent assays (DAS-ELISA) using antibodies specific for four major grapevine leafroll-associated viruses (GLRaV-1, GLRaV-2, GLRaV-3, and GLRaV-4), grapevine fan-leaf virus (GFLV), tobacco ringspot virus (TRSV), and tomato ringspot virus (ToRSV). Positive ELISA samples were further tested by reverse transcription polymerase chain reaction (RT-PCR) with primers specific for each of the viruses to confirm the ELISA results. Twenty-two samples were infected with at least one of the viruses tested. GLRaV-3 (24.19%) was the most prevalent virus detected followed by GLRaV-1 (12.90%), ToRSV (3.23%), and GLRaV-2 and TRSV (1.61%). This is the first study reporting on the presence of grapevine viruses in New England. Extensive surveys need to be conducted to evaluate the prevalence and economic impact of these viruses on New England vineyards.

Dimkpa, C.O.; Andrews, J.; Sanabria, J.; Singh, U.; Elmer, W.H.; Gardea-Torresdey, J.L.; White, J.C. 2020. Interactive effects of drought, organic matter, and zinc oxide nanoscale and bulk particles on wheat performance and grain nutrient accumulation. *Sci. Total Environ.* 722:137808.

Abstract- Drought (40% field moisture capacity), organic matter (OM; 10%) and nano-ZnO (1.7 mg/kg) vs. bulk-ZnO (3.5 mg/kg) particle effects were assessed to determine their interactive impacts on wheat performance and nutrient acquisition. Drought significantly reduced chlorophyll levels by 6%, whereas nano and bulk-ZnO particles alleviated some stress and increased levels by 14-16% compared to the control. Zn treatment under non-drought conditions increased chlorophyll levels by 21-22%, and OM increased chlorophyll levels by 29%. Drought significantly delayed panicle initiation by 3 days; OM accelerated panicle initiation by 5 days under drought; and nano and bulk-ZnO each acceler-

ated panicle initiation by 5 days under drought, all relative to the control. Drought significantly reduced grain yield by 51%; OM increased grain yield by 130% under drought; and bulk-ZnO increased grain yield under non-drought condition by 88%, relative to the control. Drought significantly lowered shoot Zn uptake by 43%. Relative to the control, nano and bulk-ZnO increased shoot Zn by 39 and 23%, respectively, in the absence of OM; OM amendment enhanced shoot Zn by 94%. Drought significantly increased grain Zn concentration by 48%; nano and bulk-ZnO, increased grain Zn by 29 and 18%, respectively, relative to the control; and OM significantly increased grain Zn by 85%. OM significantly reduced grain Fe concentration by 4 and 24% under drought and non-drought conditions, respectively. In the absence of OM, nano-ZnO significantly reduced grain Fe by 12% under drought; while nano and bulk-ZnO reduced grain Fe by 27 and 39% under drought and non-drought conditions, respectively, relative to the controls. Drought significantly inhibited N and P accumulation by 8 and 27%, respectively, while promoting K accumulation by 45%. Conversely, OM increased P accumulation by 29%, but reduced K accumulation by 44%. Understanding the interactive effects of adverse environmental conditions (e.g., drought) and potential mitigation strategies (e.g., OM amendment and Zn fertilization) can increase options for promoting plant development and improving crop productivity and quality under a changing climate.

Min, Li-Jing, Jian-Ren Ye, Xiao-Qin Wu, **De-Wei Li**, Tao Wu, Juan Song and Ya-Hui Wang. 2020. *Burkholderia pyrrocinia* strain JK-SH007 affects zinc (Zn) accumulation and translocation in tomato. Archives of Agronomy and Soil Science DOI: 10.1080/03650340.2020.1735628. <https://doi.org/10.1080/03650340.2020.1735628>

Abstract—Zinc (Zn) contamination in soil has been a serious problem world widely. Plant growth-promoting bacterium (PGPB) could have potential applications in Zn bioremediation. In this study, *Burkholderia pyrrocinia* strain JK-SH007 had a high tolerance to Zn and was able to produce indole acetic acid and siderophore, to solubilize inorganic phosphate. And it was found to promote tomato growth and tolerate to high concentration of Zn. We employed a novel combination of transmission electron microscopy (TEM) and scanning electron microscopy with electron dispersive X-ray analysis (SEM-EDX) for understanding the mechanism of Zn toxicity on plant tip morphology, ultrastructure and bacterium protection tomato cell. The high Zn soil supplement was highly toxic to the plants, biomass decreased, root growth inhibited, shoots rotted and chlorosis induced. ‘JK-SH007’ improved the relative tolerance of tomato to Zn, enhanced Zn sequestration, alleviated the associated plant damage relative to PGPB-free controls. ‘JK-SH007’ may be used to assist metal-hyperaccumulating plants in bioremediation. Eisen, Lars and Kirby C. Stafford III. 2020. Barriers to effective tick management and tick bite prevention in the United States [Forum]. J. Med. Entomol. In Press.

Abstract- Lyme and other tick-borne diseases are increasing in the United States. Development of tick control tools have focused primarily on the blacklegged tick, *Ixodes scapularis* Say. Application of acaricides or entomopathogenic fungal agents to kill host-seeking ticks or ticks on rodents can suppress *I. scapularis* abundance in residential landscapes, but evidence is lacking for impact on human tick bites or tick-borne disease. Similar studies remain limited for the lone star tick, *Amblyomma americanum* (L.). Other knowledge gaps include how well homeowners and pest control companies perform in the broadcast application of tick killing products, relative to high efficacy reported in research studies, and the tick killing potential of natural product formulations exempt from Environmental Protection Agency registration. Area-wide control based on preventing ticks from feeding on their main reproductive host, the white-tailed deer, can suppress populations of both *I. scapularis* and *A. americanum*. Some studies also suggest an impact on Lyme disease cases, but this needs to be further validated in larger-scale intervention studies. The effectiveness, scale, cost, and implementation of various tick management strategies are important considerations in efforts to reduce human-tick encounters and tick-borne disease. Additional barriers include weak incentives for industry and academia to develop, test, and register new tick and pathogen control technologies, including vaccines targeting humans, tick reproductive hosts, or wildlife pathogen reservoirs. Solutions will need to be ‘two-pronged’: improving the tick and pathogen control toolbox and strengthening the public health workforce engaging in tick control at local and state levels.

Rocha-Gutierrez, C.; Chavez-Flores, D.; Zuverza-Mena, N.; Duarte, A.; Rocha-Gutierrez, B.; Zaragoza-Contreras, E.A.; Flores-Gallardo, S. Surface organo-modification of hydroxyapatites to improve PLA/HA compatibility. *J. Appl. Polym. Sci.* 2020, accepted for publication.

Abstract- Poly-lactic acid/ hydroxyapatite (PLA/HA) composites are promising scaffolding materials for osteo-regeneration because of the PLA biodegradability and HA being a mineral bone component. Yet, PLA/HA composites without HA modification usually leads to mechanical failure due to the poor compatibility between these biomaterials. In this study we improved the PLA/HA affinity and the dispersion of the HA particles within the PLA matrix by a non-toxic HA functionalization. This approach diminished particle agglomeration which can prevent material failure. The HA particles were modified with fatty acids (adipic, sebacic, lauric and linoleic) and incorporated into a PLA matrix by polymer solution casting using chloroform as a solvent. Films were then characterized. Results showed an improvement in tensile strength (TS), elongation at break (EAB) and elastic modulus (EA) for all the composite films, after HA modification. Furthermore, when HA was modified with sebacic acid an increment in the TS was registered by four times (24.9 vs 6.6 MPa), a three times higher EA (11.8 vs 3.3 MPa) and more than 2% increment in EAB (4 vs 2.3%) with respect to the non-modified PLA/HA film. These increments are attributed to a higher dispersion of the HA particles within the PLA matrix, as shown in the scanning electron micrographs.

Williams, S.C., J.G. van Oosterwijk, M.A. Linske, S. Zatechka, L.M. Richer, C. Przybyszewski, S.K. Wikel, and K.C. Stafford III. 2020. Administration of an orally delivered substrate targeting a mammalian zoonotic pathogen reservoir population: Novel application and biomarker analysis. *Vector-Borne and Zoonotic Diseases*. Published online 26 March 2020. <https://doi.org/10.1089/vbz.2019.2612>

Abstract- Reservoir-targeted vaccines (RTVs) have the potential to be effective at breaking the transmission cycle of many tick-borne pathogens including, but not limited to, *Borrelia burgdorferi*, *B. miyamotoi*, *B. mayonii*, *Babesia microti*, and *Anaplasma phagocytophilum*. To determine what proportion of a wild reservoir species we could effectively target, we distributed an experimental non-RTV Rhodamine B (RhB)-coated pellet formulation devoid of nutrient supplementation using bait boxes with *ad libitum* access, in battery-operated time-release bait stations, and by hand broadcast. Regardless of distribution method, a total of 208 of 242 (86%) white-footed mouse (*Peromyscus leucopus*) captures were positive for RhB by either pelage staining or by detecting fluorescent expression in vibrissae under a microscope. In bait box locations, 91% of captured mice were RhB-positive, 89% in hand broadcast locations, and 80% in time-release station locations. Based on results, we are confident that the bait formulation was readily accepted regardless of distribution technique, reached a substantial proportion of the reservoir population, and provides an effective vehicle to deliver a range of RTVs to targeted, wild, pathogen reservoir populations.

Williams, Scott C., Megan A. Linske, Steve Zatechka, Luciana M. Richer, Chris Przybyszewski, Jolieke G. van Oosterwijk, Stephen K. Wikel, and Kirby C. Stafford III. 2020. Administration of an orally delivered substrate targeting a mammalian zoonotic pathogen reservoir population: Novel application and biomarker analysis. *Vector-Borne Zoonotic Dis.* [doi: 10.1089/vbz.2019.2612](https://doi.org/10.1089/vbz.2019.2612). [Epub ahead of print]

Abstract- Reservoir-targeted vaccines (RTVs) have the potential to be effective at breaking the transmission cycle of many tick-borne pathogens including, but not limited to, *Borrelia burgdorferi*, *B. miyamotoi*, *B. mayonii*, *Babesia microti*, and *Anaplasma phagocytophilum*. To determine what proportion of a wild reservoir species we could effectively target, we distributed an experimental non-RTV Rhodamine B (RhB)-coated pellet formulation devoid of nutrient supplementation using bait boxes with *ad libitum* access, in battery-operated time-release bait stations, and by hand broadcast. Regardless of distribution method, a total of 208 of 242 (86%) white-footed mouse (*Peromyscus leucopus*) captures were positive for RhB by either pelage staining or by detecting fluorescent expression in vibrissae under a microscope. In bait box locations, 91% of captured mice were RhB-positive, 89% in hand broadcast locations, and 80% in time-release station locations. Based on results, we are confident that the bait formulation was readily accepted regardless of distribution technique, reached a substantial proportion of the reservoir population, and provides an effective vehicle to deliver a range of RTVs to targeted, wild, pathogen reservoir populations.

JOURNAL ARTICLES APPROVED MARCH 2020

Adeel, M., T. Farooq, **Jason C. White**, Y. Hao, and Y. Rui. Carbon-based nanomaterial function suppress tobacco mosaic virus (TMV) infection and induce resistance in *Nicotiana benthamiana*. *Environmental Science & Technology*

Alexander, C. R., **Regan B. Huntley**, **Neil P. Schultes**, and G. S. Mourad. Functional characterization of the adenine transporter, EaAdeP, in the fire blight pathogen *Erwinia amylovora*. *FEMS Microbiology Letters*

Camp, A. A., M. A. Batres, W. C. Williams, R. W. Koethe, **Kimberly A. Stoner**, and D. M. Lehmann. Effects of the neonicotinoid acetamiprid in pollen on *Bombus impatiens* microcolony development. *Ecotoxicology*

Castroagudin, V. L., J. Weiland, F. Baysal-Gurel, M. Cubeta, M. Daughtrey, N. Gauthier, **James A. LaMondia**, D. Luster, F. Peduto-Hand, N. Shishkoff, J. Woodward-Williams, X. Zhang, N. LeBlanc, and J. Crouch. Genetic structure of contemporary populations of the boxwood blight pathogen in the U.S. *Phytopathology* (abstract)

da Silva, **Washington**, D. Kutnjak, Yi Xu, Yimin Xu, J. Giovannoni, S. F. Elena, and S. Gray. Transmission modes affect the population structure of potato virus Y in potato. *PLOS Pathogens*

Liu, Y., T. Wu, **Jason C. White**, and D. Lin. A new strategy using nZVI to simultaneously promote remediation and safe crop production in contaminated soil. *Nature Nanotechnology*

Luo, Y., T. Chen, Y. Teng, X. Wang, and **Jason C. White**. Symbiotic nitrogen fixation links dechlorination and biodegradation of polychlorinated biphenyls. *Nature Biotechnology*

Ma, **Chuanxin**, J. Borgatta, B. G. Hudson, A. A. Tamijani, **De La Torre Roche**, **Roberto**, **Nubia Zuverza-Mena**, Y. Shen, **Wade H. Elmer**, B. Xing, S. E. Mason, R. J. Hamers, and **Jason C. White**. Advanced material modulation of plant nutritional and phytohormone status suppresses soybean sudden death syndrome (SDS) and increases yield. *Nature Nano*

Marra, **Robert E.** and **James A. LaMondia**. First report of beech leaf disease, caused by the foliar nematode, *Litylenchus crenatae mccannii*, on American beech (*Fagus grandifolia*) in Connecticut. *Plant Disease*

Peng, J., **Lindsay Triplett**, and G. Sundin. Activation of metabolic and stress responses during subtoxic expression of the type I toxin hok in *Erwinia amylovora*. *Environmental Microbiology*

Si, Y. Z., G. Q. Jin, **De-Wei Li**, J. W. Sun, and L. H. Zhu. First report of *Diaporthe biconispora* causing leaf spot of *Sapindus mukorossi* in China. *Plant Disease*

Sun, J. W., Y. Z. Si, **De-Wei Li**, G. Q. Jin and L. H. Zhu. First report of leaf blotch of *Aesculus chinensis* caused by two species of *Colletotrichum* in China. *Plant Disease*

Wijayawardene, N. N., ... **De-Wei Li**, et al. Outline of *Fungi* and fungi-like taxa. *Mycosphere*

ARTICLES OF INTEREST MARCH 2020

Stephanie Preising, a senior at Southern Connecticut State University (SCSU), began an internship in **Dr. Washington da Silva's** lab in April 2019. Stephanie's passion for plant biology developed at SCSU leading her to join the **da Silva** lab at CAES in her junior year. Through this research experience, Stephanie honed her bioinformatics and molecular biology skillsets in order to apply them to her Grapevine Leafroll Disease and Fig

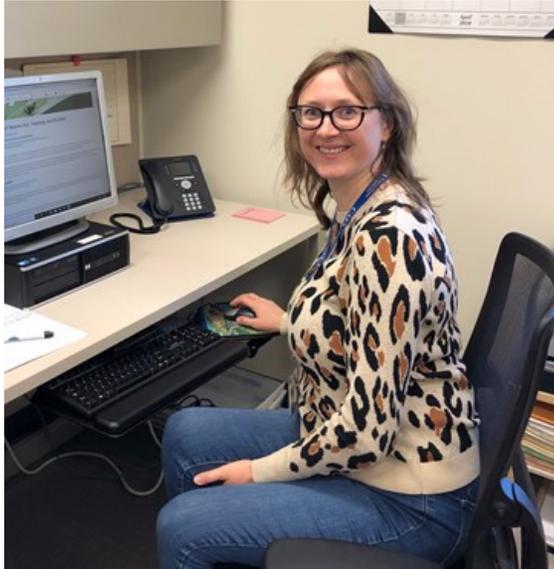
Mosaic Disease research. Through the nurturing real-world opportunities presented by Dr. da Silva’s mentorship, Stephanie has learned to prepare data and annotate viral genomes, which she has then used in global comparative genomics analyses.

She has been awarded The State University of New York (SUNY) Graduate Diversity Fellowship and has received the prestigious distinction of Cornell Dean’s Scholar. Each year, two new students are selected to receive the SUNY fellowship at Cornell University. This competitive fellowship is selected based on academic achievement, leadership abilities, and the potential of the student to become an emerging talent in their field of study. Cornell Graduate School Dean’s Scholar distinction is given to rising star students in their fields, and its purpose is to “develop a community of diverse scholars through which connections are established and maintained across all graduate fields.” This coming summer, she will be joining Dr. Michelle Heck’s molecular biology lab at the Boyce Thompson Institute in pursuit of her Ph.D. in Plant Pathology at Cornell University. What began as an internship is now a passion that she hopes to explore further in her Ph.D. program at Cornell!

“Preising is an enthusiastic researcher and dedicated student, who has proven herself to be a leader and a quick study,” said Dr. da Silva, an Assistant Scientist at CAES. “She is very dedicated and conscientious in her work and has shown great initiative and creativity in pursuit of her study goals.”



NEW STAFF, STUDENTS, AND VOLUNTEERS MARCH 2020



Gerda Magana began working in the Department of Entomology as the new State Survey Coordinator (SSC) on March 27th. She and her husband moved recently from California where she was an agricultural inspector for the County of Los Angeles. She will be overseeing the Cooperative Agricultural Pest Survey (CAPS) program and related surveys under Dr. Victoria Smith.

Dr. Srikanth Kodati joined Dr. LaMondia's research group at the Valley Laboratory in Windsor as a Postdoctoral Scientist in March 2020. His research focuses on understanding the factors influencing the development of boxwood blight and hop diseases. He received his doctoral degree from University of Nebraska-Lincoln studying the diversity and pathogenicity of *Rhizoctonia* spp. from different plant hosts in Nebraska.





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Volume 10 Issue 4
April 2020