

Station News

The Connecticut Agricultural Experiment Station
Volume 6 Issue 5 May 2016



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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ADMINISTRATION

DR. THEODORE ANDREADIS was interviewed about Zika virus and the risk of mosquito transmission in Connecticut by Jaclyn Diaz, Norwich Bulletin (April 6); presided over a quarterly meeting of the Station's Board of Control held at the Station (April 13); presented welcoming remarks and an overview of the Experiment Station and its various research, regulatory and public service programs at the Annual Meeting of the Experiment Station Associates held at the Station (April 21); was interviewed about Zika virus and the risk of mosquito transmission in Connecticut by Courtney Zieller, WFSB Channel 3, Hartford (April 28); was interview about the results of the Station's testing of lobsters from Long Island Sound for pesticides by Dave Collins, Associated Press (April 29); and welcomed and gave opening remakes at a ceremony honoring 5th grade student winners of the CTPA Arbor Day Poster Contest with a tree planting at the Station (30 attendees, April 29).

ANALYTICAL CHEMISTRY

DR. JASON C. WHITE attended the monthly CT Laboratory Preparedness meeting at the Department of Public Health Laboratory in Rocky Hill (April 4); met with Ms. Sadia Younas of Southern CT State University regarding a summer internship in the Analytical Chemistry Department (April 6); visited a third grade class at Fair Haven School in New Haven to talk about science and chemistry (20 attendees) (April 7); participated in a conference call led by Michelle Hladik of the US Geological Survey regarding an upcoming Gordon Conference focusing on water, food and nanotechnology (April 8); spoke by phone with Jan Spiegel of the CT Mirror regarding a new USDA grant that was awarded and with focus on nanoscale nutrients to suppress crop disease and enhance yield (April 9); along with **DR. WADE ELMER** hosted a teleconference call with co-investigators from The University of Texas El Paso and the Virtual Fertilizer Research Center regarding our new joint USDA funded project (April 11, 25); participated in the quarterly Association of Public Health Laboratories quarterly Agriculture/Chemistry teleconference call (April 12); attended the Dissertation Proposal Defense of Ms. Aidee Illya Medina of the University of Texas El Paso (JC White is a committee member)(April 14-15); along with **DR. LUCA PAGANO** participated in a Skype call with Dr. Fabienne Schwab of CEREGE in Provence France to discuss ongoing collaborative work (April 18); Met with SA Dan Coleman and SA Michael Syrax of the FBI to discuss nanotechnology (April 19, 21); along with **MR. MICHAEL CAVADINI** attended a meeting at CHRO in Hartford to discuss the CAES Affirmative Action Plan (April 20); along with **DR. SANGHAMITRA MAJUMDAR** participated in a conference call with co-investigators at the University of Massachusetts Amherst and The University of Texas El Paso to discuss a collaborative grant proposal being submitted to the US FDA (April 25); and was a invited speaker at the 2nd International Symposium on the Environmental Impact of Engineered Nanomaterials at the Ocean University of China in Qingdao China and gave a lecture entitled "Molecular and physiological response of crop species to engineered nanomaterial exposure" (150 attendees) (April 28-May1).

DR CHRISTINA S. ROBB participated in a conference call for the Eastern Analytical Symposium (April 8).

DR BRIAN EITZER was a participant in the conference call of the North American Chemical Residue Workshop organizing committee (April 14), along with **MR. MICHAEL CAVADINI**, **MR. JOSEPH HAWTHORNE**, **MR. CRAIG MUSANTE**, **DR. CHRISTINA ROBB**, **MS. KITTIPATH P.-RIVEROS**, **DR. SANGHAMITRA MAJUMDAR** AND **MS. TERRI ARSENAULT** was a participant in the monthly FDA FERN cCAP teleconference call (April 14); and helped teach LB511 FDA/FERN Chemistry Training for LC-MS at the Forensic Chemistry Center in Cincinnati Ohio (12 attendees) (April 25-29).

ENTOMOLOGY

DR. KIRBY C. STAFFORD III was interviewed by Nancy Marek, UConn, about ticks, tick-borne diseases, and tick bite prevention (April 6); interviewed by Evan White, WFSB, about the lone star tick (April 11); interviewed by Marcia DeSanctis for Town & Country Magazine about the growing tick population and tick-borne diseases (April 11); interviewed by Taylor Rapalyea, Republican-American, about tick activity (April 12); participated on the tick IPM symposium planning conference call (April 18); and was interviewed by Todd Lyon, New Haven Living Magazine, about ticks and work as a scientist participated in a photo shoot of entomologists for the “Players” feature of the magazine (April 29).

MR. MARK H. CREIGHTON spoke with students at the Montessori School in New Hartford, CT about honey bee biology and inspected their apiary (April 5); attended the Connecticut Beekeepers Association meeting at the Experiment Station in New Haven and spoke to the attendees about bee health issues and honey bee registration (April 16); attended Arbor Day celebration at the UCONN campus in Storrs CT and spoke with students about the Connecticut Agricultural Experiment Station and the role pollinators play in agriculture (April 19); with **DR. KIMBERLY STONER** participated in a Pollinator Health display sponsored by Congresswoman Elizabeth Etsy at the New Britain Bee Base Ball park in New Britain CT (April 22) (see figure); and spoke to students from the Thomas School here at the Experiment Station about the role honey bees play in agriculture (April 28).

DR. DOUGLAS W. DINGMAN was an invited speaker for the Department of microbiology and Molecular Biology, BYU, Provo, Utah and presented a seminar entitled; *Paenibacillus larvae* subsp. *larvae* and *pulvificiens*; honey bee pathogens with differences (April 6-8); and conducted a training workshop on sequential sampling of honey bees for *Nosema* prevalence. Bethlehem, CT (April 29).

DR. CHRIS T. MAIER exhibited live adult specimens of a cerambycid beetle known to bore into the vines of Virginia creeper at the annual dinner meeting of the Connecticut Entomological Society in Jones Auditorium (April 15).

DR. GALE E. RIDGE was interviewed by the New Haven Register about bed bugs in a New Haven High School and what appropriate protocols should be followed (April 12); interviewed about bed bugs in Hill House School by Chan-

nel 3 and NBC News (April 13); interviewed by Yale Daily News about bed bugs in the university dorms (April 18); published in the journal Springer online "Toxicity and potential utility of ivermectin and moxidectin as xenointoxicants against the common bed bug, *Cimex lectularius* L. (April 18); interviewed about bed bugs in Connecticut and best practices for management by Michael Melia from the Associated Press (April 19); hosted bed bug forum IX (65 attendees) at the Experiment Station and was interviewed by Justin Schecker NBC News and Tony Terzi Fox 61 News, and cited in the New Haven Register by the associated press in an article titled "bed bugs causing stir in Elm City" (April 25); and she was interviewed by Todd Lyon of the New Haven Living Magazine (April 28).

DR. CLAIRE E. RUTLEDGE participated in CTPA board meeting (April 12); gave a talk "Emerald Ash Borer in Connecticut" to the Friends of Brookvale Park, Hamden, CT (15 adults) (April 13); hosted and co-organized the Connecticut Tree Protective Association's Arbor Day celebration for winners of their Arbor Day poster competition and their parents. The celebration included an introduction from DR. THEODORE G. ANDREADIS, presentation of awards to the winners, planting a new tree in the Magnarelli Garden; and visits with 6 Station scientists to learn about their tree related research. (16 adults, 8 youth) (April 29).

DR. VICTORIA L. SMITH with **MS. TIA BLEVINS**, **MS. KATHERINE DUGAS**, **MR. JEFFERY FENGLER**, **MR. STEPHEN SANDREY** and **MR. PETER TRENCHARD**, participated in the annual meeting of the Eastern Plant Board/Horticultural Inspection Society/Cooperative Agricultural Pest Survey, held at HarbourTowne Resort in Saint Michaels, MD (April 4-7). Steve Sandrey received the Distinguished Service Award from the HIS (80 participants); Participated in a meeting of the CT Nursery and Landscape Association Winter Symposium Planning Committee, held at UConn (10 participants) (April 20); participated in a meeting of the Yale Biosafety committee, held at 135 College St. in New Haven (22 participants) (April 21). Three cooperative agreements under the Farm Bill were executed in April: Honey Bee Disease Survey (\$12,120), Mixed Berry Commodity Survey (\$16,908); and *Phytophthora ramorum* Nursery & Environs Survey (\$18,791).

DR. KIMBERLY A. STONER was interviewed by Kendra Bobowick of the Newtown Bee about colony losses of honey bees and decline in species diversity of bumble bees in recent years (April 1); held a charrette (design workshop) for planning an Urban Oasis pollinator garden at the CAES New Haven campus with **MR. RICHARD CECARELLI**, who will be responsible for maintaining the garden, Chris Ozyck of the Urban Resources Initiative, who is the liaison with the Urban Oasis program, Barbara Yaeger of the Experiment Station Associates, Chris Tuccio of Naugatuck Valley Community College, who teaches a course in Landscape Design, and the students in Chris Tuccio's Landscape Design course (April 12); participated in a press conference at the State Capitol at the invitation of State Senator Ted Kennedy, Jr. about the bill, "An Act Concerning Pollinator Health" (April 21); spoke to the Experiment Station Associates on "Planting for Bees" (April 21);

with **MS. TRACY ZARRILLO** and **MR. MARK CREIGHTON** presented a display on bees and pollinator health at the invitation of Congresswoman Elizabeth Esty at the New Britain Bees Stadium in New Britain (April 22); spoke to families of Arbor Day winners about life cycles of bees and pollination of plants as part of Arbor Day ceremonies (April 29); interviewed by Todd Lyon of New Haven Living magazine about bee life cycles, planting for bees and causes of bee losses; and participated in a photo shoot of entomologists for the “Players” feature of the magazine (April 29). Grants received:



Attendees at the annual meeting of the Eastern Plant Board/Horticultural Inspection Society/Cooperative Agricultural Pest Survey; from left, **Mr. Stephen Sandrey**, **Mr. Jeffrey Fengler**, **Mr. Peter Trenchard**, **Dr. Victoria Smith**, **Ms. Katherine Dugas**, and **Ms. Tia Blevins**.



Display at New Britain Bees Stadium. From left, **Dr. Kimberly Stoner**, Congresswoman Elizabeth Esty, New Britain Bees mascot, state apiary inspector **Mr. Mark Creighton**, and in front, **Marley Zar-**

ENVIRONMENTAL SCIENCES

DR. PHILIP ARMSTRONG met with Milford town officials and reporters at the Annual Mosquito Kickoff (20 attendees) (April 5) ; was interviewed by WFSB Channel 3 News about the Asian Tiger mosquito in Connecticut (April 25); was interviewed by Crossroads Magazine about the threat of Zika virus transmission in Connecticut (April 27); and was interviewed for a profile in New Haven Living Magazine on insect awareness (April 29).

MS. ANGELA BRANSFIELD participated in the Federal Select Agent Program Webinar: Changes to FD-961 Bioterrorism Risk Assessment Form (April 19, 2016).

DR. DOUG BRACKNEY presented a CAES Seminar on genetic bottlenecks, RNAi-mediated diversification, and selective constraints collectively influencing Powassan virus evolution (approx. 50 attendees) (April 27).

MR. GREGORY BUGBEE spoke to the Branford Garden Club on “Container Gardening Indoors and Out” at the Branford Community Center (approx. 75 attendees) (April 4) ; and spoke to a fifth-grade class at St. Thomas’s Day School in New Haven on “Soil Testing” (approx. 20 students) (February 28).

MR. JOHN SHEPARD presented information on the Connecticut Arbovirus Surveillance Program and West Nile Virus at a Mosquito Control Public Health Workshop held for the City of Bridgeport employees at Bass Pro Shops in Bridgeport (approx. 30 attendees) (April 18).

FORESTRY AND HORTICULTURE

DR. JEFFREY WARD along with **MR. JOSEPH P. BARSKY** and **MS. AMANDA MASSA** spoke about invasive plant control measures, forest management, and natural resource careers to high school students from Wamogo High School, Litchfield (17 students, 1 teacher) (April 8); participated in a New England Society of American Foresters planning meeting (April 26); and interviewed by Phil Leukhardt of the Hartford Courant about the effect of early April cold snap on trees (April 26).

DR. ADRIANA ARANGO VELEZ spoke on “How do Trees Cope with Stress” at the Station Arbor Day celebration (8 students, 7 adults) (April 29).

DR. ABIGAIL MAYNARD helped the preschool, pre-kindergarten, and kindergarten classes set up a learning garden at Hamden Hall Country Day School (6 teachers, 34 students) (April 18-28); judged student posters at the Sigma Xi Poster competition at Quinnipiac College (April 20); and represented the Station at a quarterly meeting of the State Technical committee in Tolland (April 27).

DR. SCOTT WILLIAMS participated in the Annual Meeting of the Executive Board of the Northeast Section of The Wildlife Society, Annapolis, MD (April 3); hosted the Annual Meeting of the membership of the Northeast Section of The Wildlife Society, Annapolis, MD (April 4); met with DEEP Wildlife Division Biologist Michael Gregonis and MDC Forester Andrew Hubbard about a collaborative deer browse research project, Barkhamsted, CT (April 18); gave invited lecture “The Role of Deer in Spreading Invasive Plants and Preventing Native Plant Regeneration” at the Northeast Natural History Conference, Springfield, MA (April 23); gave invited lecture titled “Managing Japanese Barberry Infestations Reduces Blacklegged Tick Abundance and Infection Prevalence with *Borrelia burgdorferi*” at the Trustees of Sunset Farm Annual Meeting, West Hartford (60 attendees) (April 24); and hosted the St. Thomas's Day School 5th grade class on a tour of CAES which included presentations by **DR. GALE RIDGE**, **GREG BUGBEE**, **MARK CREIGHTON**, **KATHERINE DUGAS**, **JENNIFER FANZUTTI**, **MEGAN LINSKE**, and **PETER THIEL** (3 teachers, 18 students) (April 28).

MR. MICHAEL SHORT attended the 72nd Annual Northeast Fish & Wildlife Conference in Annapolis MD where he presented a poster titled “Field-test of bait acceptance by *Peromyscus leucopus* using Rhodamine-B fluorescent dye” (500 attendees) (April 3-5).



Forestry and Horticulture staff with upper class students from Wamogo High School at Bantam Lake, Litchfield along with **DR. JEFFREY WARD AND MR. JOSEPH P. BARSKY** following a forestry field trip.

PLANT PATHOLOGY AND ECOLOGY

DR. WADE ELMER attended the Connecticut Greenhouse Grower’s “Evening at the Greenhouse” at Vauiso Farms (April 5); Conducted a workshop for the identification of *Fusarium* species at University of Massachusetts, Amherst, MA (14 attendees) (April 12); gave a presentation to the Plant Physiology Class from Southern University on “Nanoparticles in agriculture” (16 attendees) (April 14); and gave a presentation to the Girls Scouts troop on “Plant Parts and Their Diseases” in Wallingford (seven children and four adults attended) (April 20).

DR. YONGHAO LI organized the Spring 2016 Study Group for the Institute for Learning in Retirement and gave a talk titled ‘Common Diseases of Trees and Shrubs’ at Albertus Magnus College in New Haven (7 attendees) (April 27); and gave a talk about ‘Gardening Tips for Spring and Summer’ for The Graduate Clubhouse in New Haven (8 attendees) (April 28).

DR. ROBERT MARRA Gave a presentation to the Plant Physiology Class from Southern University on “Research in determining internal decay in trees and its role in forest carbon cycling (16 people attended) (April 14).

MS. LINDSAY PATRICK assisted on the Connecticut Nurserymen Foundation Scholarship Committee to interview and select the winner of CT Nurserymen Foundation Scholarships (April 5), presented the lecture, “Selecting Plants for the Landscape: Plants to Consider and Plants to Avoid” for the course *Native Plants for Sustainable Gardening* for The Institute for Learning in Retirement at Albertus Magnus College (8 participants) (April 13); gave tour of PDIO and seed testing laboratory to Southern Connecticut State University, Plant Physiology

students (17 students) (April 14); participated the University of Connecticut’s Earth Day Spring Fling and manned an informational booth about CAES and bees; participated in the Guilford Green-Earth Day on the Guilford, CT green and manned an informational booth about plant diseases and insects (April 23); and along with PAM SLETTEN gave an Arbor Day Tour of the PDIO and seed testing laboratory to the winners of the CTPA contest along with their parents (April 29).

DR. NEIL SCHULTES delivered the first two lectures in a series on “Genetically Modified Plants in Agriculture” in a Yale Course Scie031 “Current Topics in Science” (16 Undergraduate Students) (April 1 & 8); and organized and led a tour of The Plant Pathology & Ecology Department for eighteen undergraduate students in a Plant Physiology class from Southern Connecticut State University. The group heard from LINDSAY PATRICK, DR. QUAN ZENG, DR. ROBERT MARRA, and DR. WADE ELMER .

DR QUAN ZENG gave a presentation to the Plant Physiology Class from Southern University on “Current research in *Erwinia amylovora* and Fire blight on apples”(16 people attended) (April 14).

VALLEY LABORATORY

DR. JATINDER S AULAKH attended the Connecticut Invasive Plant Working Group symposium planning committee meeting held at the Valley Laboratory, Windsor (April 26).

DR. RICHARD COWLES presented “Bed bugs!” to Connecticut Community Care home health care providers, Wethersfield (28 attendees) (April 13); and gave a talk titled “Strategizing for bee health,” to Vegetation Control Service, Orange, MA (150 attendees) (April 13).

DR. JAMES LAMONDIA spoke about research on management of tobacco pathogens including poty viruses, black shank, target spot and blue mold fungicide resistance, spoke about tobacco breeding for resistance and spoke about the CORESTA pesticide residue program and strategies to reduce pesticide residues in wrapper leaves in Windsor Locks (80 attendees) (April 5); spoke about the latest research on growing hops and malting barley in Connecticut as part of a program sponsored by the Connecticut Farm Bureau in Lebanon CT (67 participants) (April 13); interviewed about winter damage to plants by Eric Stecker of the Journal Inquirer (April 26); and was interviewed about tobacco culture and diseases by Linda Rickard for a book on the history of tobacco in Windsor (April 28).

DEPARTMENTAL RESEARCH UPDATES April 2016

Ma, X.; Wang, Q.; Rossil, L.; Ebbs, S.D.; White, J.C. 2016. Multi-generational exposure to cerium oxide nanoparticles: Physiological and biochemical analysis reveals transmissible changes in rapid cycling *Brassica rapa*. *NanoImpact* 1:46-54.

Abstract: The unique redox chemistry on the surface of cerium oxide nanoparticles (CeO₂NPs) and their broad applications in society have caused many concerns over the release and accumulation of these materials in the environment. Many investigations have been conducted with regard to the environmental health and safety effect of CeO₂NPs, including their impact on plant health. However, most previous studies were conducted on the early seedling development stage, with a small number of recent investigations examining the impact of CeO₂NPs through the plants full life cycle. (e.g. from seed to seed). The main aim of this study was to assess the multi-generational (three) physiological and biochemical consequences of CeO₂NPs exposure over a range of concentrations (0-1000 mg/L) on *Brassica rapa*. The results showed that plants in the second and third generation displayed slower plant growth, smaller biomass and less and smaller silique and seeds. Plants in the later generations also contained higher hydrogen peroxide (H₂O₂) in their tissues. Together with the measurement of enzymatic activities of superoxide dismutase (SOD), catalase (CAT) and guaiacol peroxidase (GPX), our results suggest that the second and third generation plants experienced higher oxidative stress than the first generation plants. This study provided first evidence that the impact of CeO₂NPs varied across generations and long term evaluation extending several generations of plant growth is necessary to obtain a realistic understanding on the long term impact of engineered nanoparticles.

Bradfield, S.; Kumar, P.; White, J.C.; Ebbs, S. 2016. Zinc, copper, or cerium accumulation from metal oxide nanoparticles or ions in sweet potato: Yield effects and projected dietary intake from consumption. *Plant Phys. Biochem.* doi:10.1016/j.plaphy.2016.04.008.

Abstract: The potential release of metal oxide engineered nanoparticles (ENP) into agricultural systems has created the need to evaluate the impact of these materials on crop yield and food safety. The study here grew sweet potato (*Ipomoea batatas*) to maturity in field microcosms using substrate amended with three concentrations (100, 500 or 1000 mg kg DW⁻¹) of either nZnO, nCuO, or nCeO₂ or equivalent amounts of Zn²⁺, Cu²⁺, or Ce⁴⁺. Adverse effects on tuber biomass were observed only for the highest concentration of Zn or Cu applied. Exposure to both forms of Ce had no adverse effect on yield and a slight positive benefit at higher concentrations on tuber diameter. The three metals accumulated in both the peel and flesh of the sweet potato tubers, with concentrations higher in the peel than the flesh for each element. For Zn, >70% of the metal was in the flesh and for Cu >50%. The peels retained 75-95% of Ce in the tubers. The projected dietary intake of each metal by seven age-mass classes from child to adult only exceeded the oral reference dose for chronic toxicity in a scenario where children consumed tubers grown at the highest metal concentration. The results throughout were generally not different between the ENP- and ionic-treatments, suggesting that the added ENPs underwent dissolution to release their component ions prior to accumulation. The results offer insight into the fate and impact of these ENPs in soils.

Tian, M., Zhao, L. M., Li, S., Huang, J., Sui, Z., Wen, J. Z., and LI, Y. H. 2016. Pathotypes and metalaxyl sensitivity of *Phytophthora sojae* and their distribution in Heilongjiang, China 2011–2015. *J Gen Plant Pathol* 82:132–141

Abstract: A total of 395 single-zoospore isolates of *Phytophthora sojae* that were obtained from 467 soybean fields in Heilongjiang, China from 2011 to 2015 were identified for pathotypes using differential soybean cultivars with Rps1a, Rps1b, Rps1c, Rps1d, Rps1k, Rps2, Rps3a, Rps3b, Rps3c, Rps4, Rps5, Rps6, Rps7, and Rps8 resistance genes. The results showed that *P. sojae* was widespread in Heilongjiang, but not evenly distributed. A heavy infestation of *P. sojae* in eastern Heilongjiang coincided with the serious diseases caused by this pathogen in that region. Among 135 pathotypes were identified, 20 isolates matched races of *P. sojae* based on published race definitions. To our knowledge, this is the first report of races 2, 8, 23, 25, 26, 29, 33, 39, 42, 43, and 48 in Heilongjiang. Race 1, previously considered as the dominant race in Heilongjiang, only comprised 1.52 % of the isolates in the present study. Virulence frequencies of 395 isolates to 14 Rps genes ranged from 17.85 to 82.41 %. Less than 30 % of the isolates were virulent on cultivars containing Rps genes 1k, 1c, or 3a, which indicated that these Rps genes were more effective than other genes in Heilongjiang. All isolates could defeat more than two Rps genes. Ninety-six percent of the isolates were virulent against more than four Rps genes, which indicated that multi-virulence isolates existed in Heilongjiang. All 223 tested isolates were sensitive to metalaxyl, but EC50 for this fungicide against the pathogen increased 18-fold in the last 20 years. The results of the present study suggest that incorporating Rps genes 1c, 1k, and 3a into soybean cultivars and the use of metalaxyl-coated seeds should provide integrated approach to manage *Phytophthora* root and stem rot of soybean in Heilongjiang, China.

Huang, L., Li, Q.-C., Zhang, Y., Li, D.-W., Ye, J.-R., 2015. *Colletotrichum gloeosporioides sensu stricto* is a pathogen of leaf anthracnose on evergreen spindle tree (*Euonymus japonicus*). *Plant Disease* 100(4): 672-678.

Abstract: The genus *Colletotrichum* is considered the eighth most important group of plant-pathogenic fungi in the world due to its scientific and economic importance. *Colletotrichum* spp. cause anthracnose disease in a wide range of economically important plants. *Euonymus japonicus* Thunb.

(Celastraceae) is a broad-leaved evergreen tree that is widely planted in the parks and landscapes of China. An anthracnose occurs on *E. japonicus* in China but there has been a disagreement on the identity of the fungal

Kaur S., J. S. Aulakh, and A. J. Jhala 2016. Growth and seed production of glyphosate-resistant giant ragweed (*Ambrosia trifida* L.) in response to water stress. *Canadian J. Plant Sci*: Doi 10.1139/CJPS-2015-0309.

Abstract: The objectives of this study were to determine the effects of degree and duration of water stress on growth and seed production of glyphosate-resistant (GR) giant ragweed. The degree of water stress included giant ragweed response to 100, 75, 50, 25, and 12.5% of field capacity. The highest growth index (588 cm³) was achieved at 75% of field capacity with plants typically ≥ 125 cm tall and ≥ 57 leaves plant⁻¹. Giant ragweed seed production was $\geq 55, 35, 20,$ and 5 seeds plant⁻¹ at $\geq 75, 50, 25,$ and 12.5% of field capacity, respectively. The study of duration of water stress included the response of giant ragweed to withholding water for 2, 4, 6, 8, and

10 d following 100% of field capacity. Water stress of 4 d or longer reduced giant ragweed plant height $\geq 20\%$, root and shoot biomass $\geq 66\%$, number of leaves $\geq 36\%$, growth index $\geq 54\%$, and seed production by 36% compared with the 2 d of water stress. Results from this study indicate that giant ragweed can survive and produce seeds at 12.5% of field capacity or 10 d of water stress.

JOURNAL ARTICLES APPROVED April 2016

J. S. Aulakh 2016. "Herbicides for Pre-emergence Weed Control in Christmas Trees" CAES Factsheet.

Cheah, Carole A. S-J. and DeWei Li. The red bark phenomenon. *CAES Fact Sheet*

Ferrandino, F. J. and J. Bravo. Winegrape cultivar trials in Connecticut: 2012-2015. *CAES Bulletin*

LaMondia, J. A. Evaluation of fungicides for management of boxwood blight, 2014. *Plant Disease Management Reports*

LaMondia, J. A. Evaluation of fungicides for management of tobacco blue mold in shade-grown cigar wrapper tobacco, 2015. *Plant Disease Management Reports*

LaMondia, J. A. Evidence for suppression of *Meloidogyne hapla* by *Pasteuria* in Connecticut. *Journal of Nematology* (Abstract)

Li, Yonghao. Botryosphaeria cankers of woody ornamentals. *CAES Fact Sheet*

Li, Yonghao. Downy mildew of cucurbits. *CAES Fact Sheet*

Maurer, K. and J. A. LaMondia. Evaluation of fungicides for management of boxwood blight, 2015. *Plant Disease Management Reports*

Servin, A. D., H. M. Castillo, J. A. Hernandez-Viezcas, W. De Nolf, R. De La Torre-Roche, L. Pagano, J. J. Pignatello, M. Uchimiya, J. Gardea-Torresdey, and J. C. White. Bioaccumulation of nanoparticle CeO₂ by earthworms in biochar amended soil. *Environmental Science: Nano*

Shepard, John J., Theodore G. Andreadis, Michael C. Thomas, and Goudarz Molaei. Host choices of mosquitoes at eastern equine encephalitis virus foci in Connecticut. *Parasites & Vectors*

Triplett, L. R., T. Shidore, J. Long, J. Miao, S. Wu, Q. Han, C. Zhou, H. Ishihara, J. Li, B. Zhao, and J. E. Leach. AvrRxo1 is a bifunctional type III secreted effector and toxin-antitoxin system component with homologs in diverse environmental contexts. *PLOS ONE*

Wang, Yixun, Jingyuan Chen, **De-Wei Li**, Lu Zheng, and Junbin Huang. CgCUT1 gene required for cutinase activity and pathogenicity of *Colletotrichum gloeosporioides* causing anthracnose of *Camellia oleifera*. *European Journal of Plant Pathology*

Xu, Jinshan, Qiang He, Zhenggang Mal, Tian Li, Xiaoqun Dang, Xiaoyan Zhang, Bettina A. Debrunner-Vossbrinck, Zeyang Zhou, and **Charles R. Vossbrinck**. The genome of *Nosema* sp. isolate YNPr: a comparative analysis of genome evolution within the *Nosema/Vairimorpha* clade. *PLOS ONE*

GRANTS RECEIVED APRIL 2016

DR. JATINDER S AULAKH received an IR-4 grant (\$8000) for herbicide safety trials in ornamental plants.

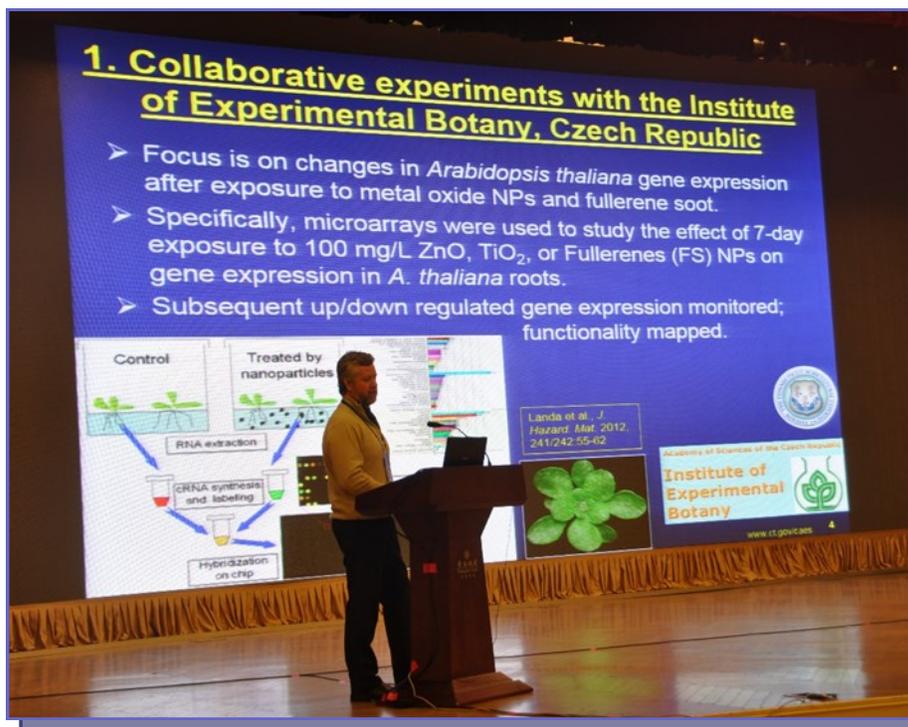
CAES was awarded a \$1500 grant from the Urban Oasis program of Audubon CT to establish a pollinator garden on the grounds of the New Haven campus. This grant was a joint effort between **DR. KIMBERLY STONER** and Barbara Yaeger of the Experiment Station Associates.



State Beekeeper, **Mr. Mark Creighton** with Senator Ted Kennedy Jr., Environment Committee Chair, at a press conference held at the State Capital to announce passage of the “Pollinator Bill”.



Dr. Jason C. White is speaking about science and chemistry to a 3rd grade class at Fair Haven School in New Haven.



Dr. Jason C. White was an invited speaker and attendee at the 2nd International Symposium on the Environmental Impact of Engineered Nanomaterials at The Ocean University of China in Qingdao China.



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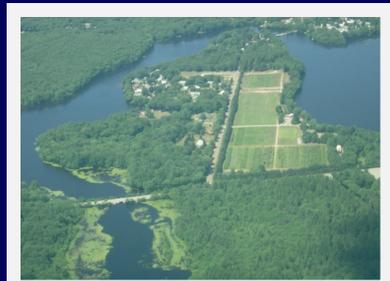
Main Laboratories, New Haven



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



Valley Laboratory, Windsor

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The Connecticut Agricultural Experiment Station

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