

Monday, April 5, 2021, Morning

Opening Session and Preliminary Business Meeting

Moderators and Organizers: Rebecca Schmidt¹ and Jacqueline Serrano², ¹USDA - ARS, Wapato, WA, ²USDA-ARS, Wapato, WA

- 11:00 Welcome: Mark Wright
- 11:10 The Legacy of C.W. Woodworth: Brian Holden, Great-grandson of C.W. Woodworth
- 11:20 2021 C.W. Woodworth Award Presentation: Changing attitudes in classical bio-control from natural-enemy-impact to risk-aversion. **Kent Daane** (kdaane@ucanr.edu), Univ. of California, Berkeley, Berkeley, CA
- 11:50 Introduction of Comstock Award recipient: Mark Wright
- 11:55 2021 Comstock Award Presentation: Mechanisms conferring behavioral resistance to the Neonicotinoid: Imidacloprid in the house fly. **Caleb Hubbard** (chubb001@ucr.edu), Univ. of California, Riverside, CA
- 12:25 Break
- 12:45 ESA section reports: Medical, Urban, and Veterinary Entomology Physiology, Biochemistry, and Toxicology Plant-Insect Ecosystems Systematics, Evolution, and Biodiversity
- 1:05 ESA Governing Board Report: Jennifer Henke
- 1:15 Reports from ESA Standing Committees
- 1:40 PBESA Executive Committee: Mark Wright
- 1:55 PBESA Secretary/Treasurer Report: Amanda Koppel
- 2:10 Announcements/New Business: Mark Wright

Monday, April 5, 2021, Afternoon

PB Grad Student - Ph.D.

Moderators and Organizers: Robert Orpet¹ and Gina Angelella², ¹Oregon State Univ., Central Point, OR, ²USDA-ARS, Wapato, WA

- 3:15 Welcoming remarks
- 3:25 Pathogen survey of natural *Osmia lignaria* Say (Hymenoptera: Megachilidae) nests collected from Utah. **Mary-Kate Williams** (mfwilliams@aggiemail.usu.edu)¹ and Diana Cox-Foster², ¹Utah State Univ., Logan, UT, ²USDA - ARS, Logan, UT
- 3:37 Environmental and biological drivers of plant-pollinator interaction rewiring. **Kaysee Arrowsmith** (kcarrows@uw.edu) and Berry Brosi, Univ. of Washington, Seattle, WA
- 3:49 Redistribution and establishment of the samurai wasp, *Trissolcus japonicus*, a biological control agent of the invasive brown marmorated stink bug, *Halyomorpha halys*, in Oregon. **Claire Donahoo** (donahooc@oregonstate.edu)¹, David Lowenstein², Richard Hilton³, Heather Andrews⁴ and Nik G. Wiman¹, ¹Oregon State Univ., Corvallis, OR, ²Michigan State Univ., East Lansing, MI, ³Oregon State Univ., Central Point, OR, ⁴Oregon State Univ., Aurora, OR
- 4:01 Psyllid microbiomes across the psyllid tree of life and the discovery of a new *Candidatus Liberibacter* species. **Younghwan Kwak** (ykwak006@ucr.edu)¹, Penglin Sun¹, Venkata Meduri¹, Diana Percy², Kerry Mauck³ and Allison Hansen¹, ¹Univ. of California, Riverside, CA, ²UBC Botanical Garden and Centre for Plant Research, Vancouver, BC, Canada, ³Univ. of California, Riverside, Riverside, CA

- 4:13 Use of vibrational playbacks as mating disruption in *Cacopsylla pyricola*. **Downen Jocson** (downen.jocson@wsu.edu)¹, David R. Horton², Elizabeth Beers³ and David Crowder¹, ¹Washington State Univ., Pullman, WA, ²USDA - ARS, Wapato, WA, ³Washington State Univ., Wenatchee, WA
- 4:25 Origins and consequences: Cucurbit aphid-borne yellows virus, an exotic plant virus found in wild Southern California plants. **Tessa Shates** (tshat003@ucr.edu)¹, Marco Gebiola², Penglin Sun³ and Kerry Mauck³, ¹Univ. of California, Riverside, CA, ²Univ. of California Riverside, Riverside, CA, ³Univ. of California, Riverside, Riverside, CA
- 4:37 Break
- 4:47 First report of *Hypera postica* Gyllenhal (Coleoptera: Curculionidae) resistance to lambda cyhalothrin in Montana. **Erika Rodbell** (earodbell@gmail.com) and Kevin Wanner, Montana State Univ., Bozeman, MT
- 4:59 A weevil's movement can inform environmental safety assessments in biological weed control. **Jessica Fung** (jfung@uidaho.edu)¹, Karuna Nepal¹, Basu Kafle², Sanford Eigenbrode¹ and Mark Schwarzlaender¹, ¹Univ. of Idaho, Moscow, ID, ²Auburn Univ., Auburn, AL
- 5:11 Asilidae (Diptera: Asiloidea) of Belize. **Charlotte Alberts** (ceherbert@ucdavis.edu), Univ. of California, Davis, CA
- 5:23 Decoding the mosquito taste system, one sensillum at a time. **Adriana Lomelí** (amedio03@ucr.edu)¹ and Anupama Dahanukar², ¹Univ. of California Riverside, Riverside, CA, ²Univ. of California, Riverside, CA
- 5:35 Morphological phylogeny of bedbugs and their relatives, with an emphasis on their evolution of traumatic insemination. **Ifeoma Ugwuanyi** (i.ugwuanyi@student.unsw.edu.au)¹, Nikolai J. Tatarnic² and Gerry Cassis¹, ¹Univ. of New South Wales, Sydney, NSW, Australia, ²Western Australian Museum, Welshpool, VIC, Australia

General Ten Minute Papers (TMPs)

Moderators and Organizers: Rebecca Schmidt-Jeffris¹, Surendra Dara² and Gabriel Zilnik³, ¹USDA - ARS, Wapato, WA, ²Univ. of California Cooperative Extension, San Luis Obispo, CA, ³USDA-ARS, Maricopa, AZ

- 3:30 Introductory remarks
- 3:40 Difference in foliar fatty acid composition between potato cultivars influences Colorado potato beetle feeding preference. **Justin Clements** (justinclements@uidaho.edu)¹, Benjamin Bradford², Russell Groves², Shelley Jansky², Megan Lipke² and Jake Olson², ¹Univ. of Idaho, Parma, ID, ²Univ. of Wisconsin, Madison, WI
- 3:52 Enhancing diamondback moth IPM with mating disruption. **Surendra Dara** (skdara@ucdavis.edu), Univ. of California Cooperative Extension, San Luis Obispo, CA
- 4:04 Effects of heat wave timing on development of *Trissolcus japonicus*. **Ryan Paul** (ryan.paul@usda.gov) and Jana Lee, USDA - ARS, Corvallis, OR
- 4:16 Evaluating the use of soil applied insect pathogenic fungi to control overwintering olive fruit fly, *Bactrocera oleae*. **Joanna Fisher** (jfisher@ucdavis.edu) and Frank Zalom, Univ. of California, Davis, CA
- 4:28 Role of SPEAR-LEP, a novel peptide-based bioinsecticide, for the management of lepidopteran pests in vegetable crops. **Marja Koivunen** (mekoivunen@gmail.com) and Daniel Peck, Vestaron Corp, Durham, NC
- 4:40 High temperatures and low activity: A survey of forensically important blow flies (Diptera: Calliphoridae) in Phoenix, Arizona. **Andrew Meeds** (Andrew.Meeds@asu.edu)¹, Travis Rusch², Danielle Falcone¹ and Lauren Weidner¹, ¹Arizona State Univ., Glendale, AZ, ²Univ. of Wyoming, Laramie, WY
- 4:52 Break
- 5:04 Ecoinformatics reveals with increased foliar insecticide applications low marginal effects on insect abundance in North Carolina tobacco. **Gabriel Zilnik** (gabriel.zilnik@usda.gov)¹ and Hannah Burrack², ¹USDA-ARS, Wapato, WA, ²North Carolina State Univ., Raleigh, NC

5:16 Long-term monitoring of insecticide resistance for the Western tarnished plant bug in cotton (*Lygus hesperus*). **Buddhi Achhami** (bachhami@ucdavis.edu)¹, Treanna Pierce² and Ian Grettenberger¹, ¹Univ. of California, Davis, CA, ²Univ. of California, Shafter, CA

5:28 Population dynamics and control of aphids in Pacific Northwest hazelnuts. **Heather Andrews** (heather.andrews@oregonstate.edu)¹, Erica Rudolph¹, Tatum Keyes¹ and Nik G. Wiman², ¹Oregon State Univ., Aurora, OR, ²Oregon State Univ., Corvallis, OR

5:40 The current status of forensic entomology in the Pacific regions of the United States. **Lauren Weidner** (lauren.weidner@asu.edu), Arizona State Univ., Glendale, AZ

5:52 A mathematical model for the interaction between *Bactrocera dorsalis* and *Fopius arisanus* in Senegal, West Africa. **Natalie Cody** (ngcody@ncsu.edu)¹, H. T. Banks¹, John Banks², Annabel Meade¹, Hang Nguyen¹, Elhadji Dieng³, Nicholas Manoukis⁴, Stephanie Gayle⁴ and Roger Vargas⁴, ¹North Carolina State Univ., Raleigh, NC, ²California State Univ., Seaside, CA, ³Crop Protection Directorate, Dakar, Senegal, ⁴USDA - ARS, Hilo, HI

6:04 How can genetics tools inform the management of the Blue Orchard Bee, *Osmia lignaria* Say, 1837? **Jonathan Koch** (jonathan.koch@usda.gov)¹, Ashley Rohde², James Strange³, Theresa Pitts-Singer⁴ and Michael Branstetter⁴, ¹USDA-ARS Pollinating Insect Research Unit, Logan, UT, ²US Geological Survey, Boise, ID, ³The Ohio State Univ., Columbus, OH, ⁴USDA - ARS, Logan, UT

6:16 Identification of key plant-host Volatiles affecting behavior of brown marmorated stink bug - *Halyomorpha halys* (Hemiptera: Pentatomidae) on commercial hazelnuts. **Gabriella Tait** (gabriella.tait@oregonstate.edu)¹, Enrico Mirandola², Serhan Mermer¹, Canessa Thomas³ and Vaughn Walton¹, ¹Oregon State Univ., Corvallis, OR, ²Università di Padova, ., Italy, ³Oregon State Univ., Corvallis, OR

6:28 Development of new tools for sustainable management of spotted-wing drosophila. **Vaughn Walton** (vaughn.walton@oregonstate.edu), Serhan Mermer and Gabriella Tait, Oregon State Univ., Corvallis, OR

6:40 New tools for wireworm monitoring and management. **Wim Van Herk** (wim.vanherk@canada.ca)¹, Terisha Mitchell², Bob Vernon³, Emily Lemke⁴ and Jacqueline Serrano⁵, ¹Agriculture and Agri-Food Canada, Agassiz, BC, Canada, ²Agriculture and Agri-Food Canada, Agassiz, BC, Canada, ³Sentinel IPM Services, Chilliwack, BC, Canada, ⁴Thompson Rivers Univ., Kamloops, BC, Canada, ⁵USDA-ARS, Wapato, WA

Monday, April 5, 2021, Evening

PB Grad Student - M.S.

Moderators and Organizers: William Walker¹ and Peter Follett², ¹USDA-ARS, Wapato, WA, ²USDA - ARS, Hilo, HI

6:00 Welcoming remarks

6:10 Limonic acid as a sex attractant of *Limoni* spp. (Coleoptera: Elateridae) pests across North America. **Emily Lemke** (elemke96@gmail.com)¹, Wim Van Herk², Gerhard Gries³, Regine Gries³, Jacqueline Serrano⁴, Haley Catton⁵, Kevin Wanner⁶, Peter Landolt⁷, William Cooper⁷, Scott Meers⁸, Arash Rashed⁹, Jocelyn Smith¹⁰, Santosh Kumar³ and Frank Etzler⁶, ¹Thompson Rivers Univ., Kamloops, BC, Canada, ²Agriculture and Agri-Food Canada, Agassiz, BC, Canada, ³Simon Fraser Univ., Burnaby, BC, Canada, ⁴USDA-ARS, Wapato, WA, ⁵Agriculture and Agri-Food Canada, Lethbridge, AB, Canada, ⁶Montana State Univ., Bozeman, MT, ⁷USDA - ARS, Wapato, WA, ⁸Mayland Consulting, Calgary, AB, Canada, ⁹Virginia Polytechnic Institute and State Univ., Blacksburg, VA, ¹⁰Univ. of Guelph, Ridgetown, ON, Canada

6:22 Evaluating the efficacy and attractiveness of an aggregation pheromone, vittatalactone, for cucumber beetles in northern California. **Jasmin Ramirez Bonilla** (jramirezbonilla@ucdavis.edu)¹, Donald Weber², Amber Vinchesi-Vahl³ and Ian Grettenberger⁴, ¹Univ. of California, Davis, CA, ²USDA - ARS, Beltsville, MD, ³UC-ANR, Colusa, CA, ⁴Univ. of California, Davis, CA

6:34 O moth, where art thou: Tracking navel orangeworm among tree nut orchards. **Joshua Reger** (joshuar@ucr.edu)¹, Raman Bansal² and Houston Wilson³, ¹Univ. of California, Riverside, CA, ²USDA - ARS, Parlier, CA, ³Univ. of California, Riverside, CA

6:46 Floral resources for the conservation and enhancement of *Trissolcus japonicus* (Ashmead), a parasitoid of the invasive *Halymorpha halys* (Stål). **Kate Richardson** (cupkate54@gmail.com), Diane Alston and Lori Spears, Utah State Univ., Logan, UT

6:58 Gut-content analysis to determine previous host plants of *Leptoglossus zonatus* infesting California orchards. **Danielle Evans** (deevans@ucr.edu)¹, Jacob Wenger¹ and Houston Wilson², ¹California State Univ., Fresno, CA, ²Univ. of California, Riverside, Riverside, CA

7:10 Below ground natural enemy interactions with above ground herbivores. **Nicholas Morris** (nsmorris@uidaho.edu), Univ. of Idaho, Moscow, ID

PB Undergrad Student

Moderators and Organizers: Tobin Northfield¹ and Brandon Hopkins², ¹Washington State Univ., Wenatchee, WA, ²Washington State Univ., Pullman, WA

6:00 Welcoming remarks

6:10 Utilizing soluble silicon fertilizer to augment traditional Integrated Pest Management (IPM) programs for Hawaii *dendrobium* growers. **Ryan Porter** (porter3@hawaii.edu)¹, Joanne Lichty¹, Russell Galanti² and Joanna Bloese², ¹Univ. of Hawaii at Manoa, Hilo, HI, ²Univ. of Hawai'i at Manoa, Hilo, HI

6:22 Examining the effects of a novel biostimulant on production parameters and pest complexes in Hawaii anthuriums. **Tiani Kow** (tianikow@hawaii.edu)¹, Michael DuPonte² and Joanna Bloese², ¹Univ. of Hawaii at Manoa, Hilo, HI, ²Univ. of Hawai'i at Manoa, Hilo, HI

6:34 Temperature analysis for the interaction model between *Bactrocera dorsalis* and *Fopius arisanus* in Senegal, West Africa. **Hang Nguyen** (hangnguyen.1250@gmail.com)¹, Natalie Cody¹, H. T. Banks¹, John Banks², Annabel Meade¹, Elhadji Dieng³, Nicholas Manoukis⁴, Stephanie Gayle⁴ and Roger Vargas⁴, ¹North Carolina State Univ., Raleigh, NC, ²California State Univ., Seaside, CA, ³Crop Protection Directorate, Dakar, Senegal, ⁴USDA - ARS, Hilo, HI

6:46 Sublethal effects of the fungus, *Beauveria bassiana*, on olive fruit fly, *Bactrocera oleae* (Diptera: Tephritidae). **Sophia Li** (sopli@ucdavis.edu), Joanna Fisher and Frank Zalom, Univ. of California, Davis, CA

6:58 Blow flies and the American diet: Effects of fat content on blow fly (Diptera: Calliphoridae) development. **Andrew Noblesse** (anobless@asu.edu), Andrew Meeds and Lauren Weidner, Arizona State Univ., Glendale, AZ

7:10 Is SPAM good enough for *Lucilia sericata*? An analysis of food sources for entomological crime scene collections **Tessa Jung** (tajung@asu.edu), Andrew Meeds and Lauren Weidner, Arizona State Univ., Glendale, AZ

7:22 Flea species diversity and prevalence of flea-borne Typhus from urban wildlife in Orange County, California, 2015-2019. **Amanda Penicks** (amanda.k.penicks@gmail.com)¹, Laura Krueger², Daisy Rangel¹, Kiet Nguyen¹ and Robert Cummings¹, ¹Orange County Mosquito and Vector Control District, Garden Grove, CA, ²Orange County Mosquito and Vector Control, Garden Grove, CA

Tuesday, April 6, 2021, Morning

Insect Vectors of Plant Disease

Moderators and Organizers: Tobin Northfield, Cesar Reyes Corral and Abigail Clarke, Washington State Univ., Wenatchee, WA

11:00 Introductory remarks

11:00 Economic implications of vector manipulation by plant pathogens. **Sanford Eigenbrode** (sanforde@uidaho.edu)¹ and Richard Gomulkiewicz², ¹Univ. of Idaho, Moscow, ID, ²Washington State Univ., Pullman, WA

11:20 Using host associated differentiation to track vector aphid movement into crops. **Gina Angelella** (gina.angelella@gmail.com)¹, Andy Michel² and Ian Kaplan³, ¹Purdue Univ., West Lafayette, VA, ²The Ohio State Univ., Wooster, OH, ³Purdue Univ., West Lafayette, IN

11:40 Are those taters on your teeth? Using gut content analysis to confirm movement by *Bactericera cockerelli* (Šulc) (Hemiptera: Trioziidae) between potato and *Physalis longifolia* (Solanaceae) **Cesar Reyes Corral** (cesar.reyescorral@wsu.edu)¹, William Cooper², David R. Horton², Eugene Miliczky², Jennifer Riebe³, Timothy Waters⁴ and Alexander Karasev⁵, ¹Washington State Univ., Wenatchee, WA, ²USDA - ARS, Wapato, WA, ³JFR Crop Care, Caldwell, ID, ⁴Washington State Univ., Pasco, WA, ⁵Univ. of Idaho, Moscow, ID

12:00 Feeding observations of X Disease vector *Colladonus reductus*. **Abigail Clarke** (abby.clarke@wsu.edu)¹ and Tobin Northfield², ¹Washington State Univ., WENATCHEE, WA, ²Washington State Univ., Wenatchee, WA

12:20 Break

12:30 Assessing complex plant-mediated interactions among pea aphid vectors and legume crop plants. **Saumik Basu** (saumik.basu@wsu.edu) and David Crowder, Washington State Univ., Pullman, WA

12:50 Revisiting the role of the blue-green sharpshooter (*Graphocephala atropunctata*) in Pierce's disease dynamics. **Matthew Daugherty** (matt.daugherty@ucr.edu)¹, Monica Cooper² and Rodrigo P. P. Almeida³, ¹Univ. of California, Riverside, CA, ²Univ. of California, Napa, CA, ³Univ. of California Berkeley, Berkeley, CA

1:10 Pierce's disease and the California north coast: assessing the role of spittlebug vectors. **Dylan J. Beal** (dylan.beal@berkeley.edu)¹, Amielia Adams², Monica Cooper³, Matthew Daugherty⁴, Cindy Kron⁵, Alexander H. Purcell⁶, Rhonda Smith⁷, Lucia Varela⁸ and Rodrigo P. P. Almeida⁹, ¹Univ. of California, Berkeley, CA, ²UC Cooperative Extension, Napa, CA, ³Univ. of California, Napa, CA, ⁴Univ. of California, Riverside, CA, ⁵UCANR, Santa Rosa, CA, ⁶UC Berkeley, Berkeley, CA, ⁷UC Cooperative Extension, Santa Rosa, CA, ⁸Univ. of California Cooperative Extension, Santa Rosa, CA, ⁹Univ. of California Berkeley, Berkeley, CA

1:30 Biological control of Asian citrus psyllid, the vector of Huanglongbing. **Mark Hoddle** (mark.hoddle@ucr.edu), Univ. of California, Riverside, CA

1:50 Kaolin clay and plastic ground covers for control of X-disease vectors. Adrian Marshall and **Tobin Northfield** (tnorthfield@wsu.edu), Washington State Univ., Wenatchee, WA

PBESA Comstock Winners: Where Are They Now? Part 1

Moderators and Organizers: Rebecca Schmidt-Jeffris¹ and Jacqueline Serrano², ¹USDA - ARS, Wapato, WA, ²USDA-ARS, Wapato, WA

11:00 Introductory remarks

11:10 University of Maryland Department of Entomology Hamby Lab. **Kelly Hamby** (kahamby@umd.edu), Univ. of Maryland, College Park, MD

11:35 An entomologists journey to understand how insects harm animal production. **Alec Gerry** (alec.gerry@ucr.edu), Univ. of California, Riverside, CA

12:00 Long-sought answers to burning questions: My research journey since the Comstock Award. **Elaine Backus** (elaine.backus@usda.gov), USDA Agricultural Research Service, Parlier, CA

12:25 The evolution of my evolution research: Nearing one decade of work on *Wolbachia*-insect interactions. **Amelia Lindsey** (alindsey@umn.edu), Univ. of Minnesota, Saint Paul, MN

12:50 Break

1:05 Applied chemical ecology of forest insects. **Jeremy Allison** (jeremy.allison@canada.ca), Natural Resources Canada, Sault Ste. Marie, ON, Canada

1:30 Elated chemical ecologist: Advances in elaterid pheromone chemistry. **Jacqueline Serrano** (jacqueline.serrano@usda.gov), USDA-ARS, Wapato, WA

1:55 A metamorphic journey of an entomologist. **Hal Reed** (hreed@oru.edu), Oral Roberts Univ., Tulsa, OK

Tuesday, April 6, 2021, Afternoon

Plenary

Moderators and Organizers: Jacqueline Serrano¹ and Rebecca Schmidt-Jeffris², ¹USDA-ARS, Wapato, WA, ²USDA - ARS, Wapato, WA

2:30 From hopeless to harbinger: Conservation and invasive species in Hawaii foretells a bleak future for the U.S. mainland. **Daniel Rubinoff** (rubinoff@hawaii.edu), Univ. of Hawai'i, Honolulu, HI

Supporting Pollinators and Pollination in the PNW

Moderators and Organizers: Brandon Hopkins, Kelly Kulhanek and Rachel Olsson, Washington State Univ., Pullman, WA

4:00 Welcoming remarks

4:05 Long-term honeybee health - where we are and where are we headed. **Arathi Seshadri (H.S. Arathi)** (arathi.seshadri@usda.gov), USDA - ARS, Davis, CA

4:25 Supporting pollinators in California agricultural and urban environments. **Elina Niño** (elnino@ucdavis.edu), Univ. of California, Davis, CA

4:45 Effects of fire and smoke on honey bees exposed to wildfires. **Ramesh Sagili** (ramesh.sagili@oregonstate.edu), Oregon State Univ., Corvallis, OR

5:05 Bacteriophage of the honey bee gut microbiome. **James VanLeuven** (jvanleuven@uidaho.edu), Univ. of Idaho, Moscow, ID

5:25 The role of honey bee hive density modification on increasing pollination in blueberry systems. **Lisa DeVetter** (lisa.devetter@wsu.edu), Washington State Univ. Northwestern Washington Research and Extension Center, Mount Vernon, WA

5:45 Break

6:05 Colony-level pesticide exposure affects honey bee (*Apis mellifera* L.) royal jelly production and nutritional composition. **Priyadarshini Chakrabarti Basu** (priyadarshini.chakrabarti@oregonstate.edu), Oregon State Univ., Corvallis, OR

6:25 Beyond brood: the impacts of insect growth disruptors on the health and performance of honey bees. **Julia Fine** (julia.fine@usda.gov), Invasive Species and Pollinator Health Research Unit, USDA-ARS, Davis, CA

6:45 Pollen meta-barcoding reveals patterns of resource use among pollinators across diversified farms. **Robert Schaeffer** (robert.schaeffer@usu.edu), Utah State Univ., Logan, UT

7:05 Getting real: Increased adoption of bee-friendly farming through industry-led Bee Protection Protocols in Oregon. **Andony Melathopoulos** (andony.melathopoulos@oregonstate.edu)¹, Nicole Anderson¹ and Diane Alston², ¹Oregon State Univ., Corvallis, OR, ²Oregon State Univ., Dept. of Horticulture, Aurora, OR

7:25 Concluding remarks

Classical Biological Control of Invasive Pests Infesting Perennial Ecosystems

Moderators and Organizers: Mark Hoddle¹, Judith Stahl², Ricky Lara³ and Kent Daane⁴, ¹Univ. of California, Riverside, CA, ²Univ. of California Berkeley, Parlier, CA, ³California Dept. of Food and Agriculture, Sacramento, CA, ⁴Univ. of California, Berkeley, Berkeley, CA

4:00 Welcoming remarks

4:05 Classical biological control of erythrina gall wasp in Hawaii. **Mark Wright** (markwrig@hawaii.edu)¹, Leyla V. Kaufman² and Juliana A. Yalamar³, ¹Univ. of Hawai'i, Honolulu, HI, ²Hawai'i Invasive Species Council, Honolulu, HI, ³Hawai'i Dept. of Agriculture, Honolulu, HI

- 4:25 A timely matter, using smart traps to study the circadian activity of pest insects. **Quentin Geissmann** (qgeissmann@gmail.com)¹, Paul Abram², Di Wu¹, Cara Haney¹ and Juli Carrillo¹, ¹The Univ. of British Columbia, Vancouver, BC, Canada, ²Agriculture and Agri-Food Canada, Agassiz, BC, Canada
- 4:45 The psyllid *Arytinnis hakani* as a biological control agent for the invasive weed French broom. **Brian Hogg** (brian.hogg@ars.usda.gov), Patrick Moran and Lincoln Smith, USDA - ARS, Albany, CA
- 5:05 An overview of new and long-established classical weed biocontrol programs in Washington State. **Jennifer Andreas** (jandreas@wsu.edu), Washington State Univ. Extension, Puyallup, WA
- 5:25 Optimizing the mass rearing of a spotted-wing drosophila parasitoid. **Judith Stahl** (judithmstahl@gmail.com)¹, Thomas Martin¹, Brian Hogg² and Kent Daane³, ¹Univ. of California Berkeley, Parlier, CA, ²USDA - ARS, Albany, CA, ³Univ. of California, Berkeley, Berkeley, CA
- 5:45 NGS metabarcoding for assessment of post-introduction non-target effects in Hawaiian rainforest communities. **Natalie Graham** (n.graham@berkeley.edu)¹, Henrik Krehenwinkel², George Roderick¹ and Rosemary Gillespie¹, ¹Univ. of California, Berkeley, CA, ²Universität Trier, Trier, Germany
- 6:05 Break
- 6:10 Enhancing *Trissolcus japonicus* to control brown marmorated stink bug. **Jana Lee** (jana.lee@usda.gov) and Ryan Paul, USDA - ARS, Corvallis, OR
- 6:30 Genome-wide assessment of establishment, gene flow, and range expansion in the tamarisk leaf beetle (*Diorhabda* spp). **Amanda Stahlke** (amandastahlke@gmail.com)¹, Elyn Bitume², Eliza Clark³, Zeynep Ozsoy⁴, Dan Bean⁵, Ruth Hufbauer³ and Paul Hohenlohe¹, ¹Univ. of Idaho, Moscow, ID, ²USDA - Forest Service, Hilo, HI, ³Colorado State Univ., Fort Collins, CO, ⁴Colorado Mesa Univ., Grand Junction, CO, ⁵Colorado Dept. of Agriculture, Palisade Insectary, Palisade, CO
- 6:50 Nez Perce Tribe-Biocontrol Center: The power of approved biological control agents in addressing invasive/noxious weeds that exist across large landscapes through the spirit of “neighbors helping neighbors”. **Paul Brusven** (pbrusven@nezperce.org), Nez Perce Biocontrol Center, Lapwai, ID
- 7:10 Proactive classical biological control of *Tuta absoluta* in California. **Ricky Lara** (ricky.lara@cdfa.ca.gov)¹, Brian Hogg² and Charles Pickett¹, ¹California Dept. of Food and Agriculture, Sacramento, CA, ²USDA - ARS, Albany, CA
- 7:30 What is the economic value of classical biological control for arthropods? **Steven Naranjo** (steve.naranjo@ars.usda.gov)¹, George Frisvold² and Peter Ellsworth³, ¹USDA - ARS, Maricopa, AZ, ²Univ. of Arizona, Tucson, AZ, ³Univ. of Arizona, Maricopa, AZ
- 7:50 Concluding remarks

Molecular Underpinnings of Insects: Genes, Proteins and the Transcripts In-Between

Moderators and Organizers: Joe Hull¹ and William Cooper², ¹USDA - ARS, Maricopa, AZ, ²USDA - ARS, Wapato, WA

- 4:00 Welcoming remarks
- 4:05 Genetic tools for exploring neuroethology in *Drosophila*. **Ysabel Giraldo** (ysabel.giraldo@ucr.edu), Univ. of California, Riverside, Riverside, CA
- 4:20 CRISPR-Cas9-based genome editing in the silverleaf whitefly (*Bemisia tabaci*). **Chan Heu** (Chan.Heu@usda.gov), USDA-ARS, Hilo, HI
- 4:35 Olfactory reprogramming in *Anopheles stephensi*: Can we engineer a human-avoiding mosquito? **Zachary Speth** (zspeth@nevada.unr.edu)¹ and Andrew Nuss², ¹Univ. of Nevada, Reno, NV, ²Univ. of Nevada Reno, Reno, NV
- 4:50 Transporter-mediated cellular uptake of ecdysone and its potential application. **Naoki Yamanaka** (naoki.yamanaka@ucr.edu), Univ. of California, Riverside, CA
- 5:05 Unlocking the olfactory routes of the screwworm oviposition behavior. **Daniel Paulo** (daniel.f.paulo@gmail.com), Univ. of Campinas, Campinas, Brazil; Univ. of Hawai'i, Hilo, HI

- 5:20 What makes a tick tick - epigenetics and the methylome. **Arvind Sharma** (arvinds@unr.edu)¹ and Monika Gulia-Nuss², ¹Univ. of Nevada, Reno, Reno, NV, ²Univ. of Nevada, Reno, NV
- 5:35 Targeted RNA sequencing reveals differential patterns of transcript expression in geographically discrete, insecticide resistant populations of *Leptinotarsa decemlineata* . **Justin Clements** (justinclements@uidaho.edu), Univ. of Idaho, Parma, ID
- 5:50 Phylogenomics provides insights into Neotropical fruit flies evolution. **Carlos Congrains** (carloscongrains@gmail.com), Univ. of Hawai'i, Hilo, HI
- 6:05 Break
- 6:20 Exploring gene expression signatures for stressors on bumble bee queen health. **Claudinea Costa** (claudinp@ucr.edu), Univ. of California, Riverside, CA
- 6:35 Predicting Neuropeptide F functions with RNAseq in the tobacco hornworm, *Manduca sexta*. **Gurlaz Kaur** (gurlazk@nevada.unr.edu) and Andrew Nuss, Univ. of Nevada Reno, Reno, NV
- 6:50 Targeting signaling pathways to manipulate mosquito biology and pathogen transmission. **Michael Riehle** (mriehle@ag.arizona.edu), Univ. of Arizona, Tucson, AZ
- 7:05 Insulin signaling in the western tarnished plant bug, *Lygus hesperus*. **Devin Mazolewski** (dmazolewski@nevada.unr.edu)¹ and Andrew Nuss², ¹Univ. of Nevada, Reno, NV, ²Univ. of Nevada Reno, Reno, NV
- 7:20 Molecular underpinnings of insects: Reflection on research collaborations with Steve Garczynski. **William Cooper** (rodney.cooper@ars.usda.gov), USDA - ARS, Wapato, WA
- 7:35 Molecular genetics of the codling moth (*Cydia pomonella*) olfactory systems. **William Walker** (william.walker@usda.gov), USDA-ARS, Wapato, WA
- 7:50 Neuropeptides and peptide hormones in codling moth. **Man-Yeon Choi** (man-yeon.choi@usda.gov), USDA-ARS Horticultural Crops Research Unit, Corvallis, OR
- 8:05 A monolith to molecular mish mash – exploring a non-model pest peptidome. **Joe Hull** (Joe.Hull@ars.usda.gov), USDA - ARS, Maricopa, AZ
- 8:20 Concluding remarks

Tuesday, April 6, 2021, Evening

PBESA Entomology Games

Moderators and Organizers: Jacqueline Serrano¹, Alix Whitener² and Dane Elmquist³, ¹USDA-ARS, Wapato, WA, ²FMC Agricultural Solutions, Malaga, WA, ³Univ. of Idaho, Moscow, ID

9:00 PM - 11:00 PM

Wednesday, April 7, 2021, Morning

PBESA Comstock Winners: Where Are They Now? Part 2

Moderators and Organizers: Jacqueline Serrano¹ and Rebecca Schmidt-Jeffris², ¹USDA-ARS, Wapato, WA, ²USDA - ARS, Wapato, WA

11:00 Welcoming remarks

11:05 Looking over my shoulder at the roads I have travelled. **Timothy D. Paine** (timothy.paine@ucr.edu), Univ. of California, Riverside, CA

11:30 My academic life: Coming full circle. **Deirdre Prischmann** (deirdre.prischmann@ndsu.edu), North Dakota State Univ., Fargo, ND

11:55 From the Comstock Award to Comstock Hall: Decades of adventures in science. **Jeffrey Scott** (jgs5@cornell.edu), Cornell Univ., Ithaca, NY

12:20 Break

12:35 A career long effort to manipulate natural enemies in agro-ecosystems. **Cesar Rodriguez-Saona** (crodriguez@njaes.rutgers.edu), Rutgers, The State Univ. of New Jersey, New Brunswick, NJ

1:00 Biocontrol in tree fruit: How it started, how it's going. **Rebecca Schmidt-Jeffris** (Rebecca.Schmidt@usda.gov), USDA - ARS, Wapato, WA

1:25 Hemipteran microbiomes and their interactions with insect host genomes. **Allison Hansen** (ahans003@ucr.edu), Univ. of California, Riverside, CA

Emerging Arthropod Pests of the Pacific

Moderators and Organizers: Joshua Milnes and Michael Bush, Washington State Dept. of Agriculture, Yakima, WA

11:00 Behavior and economic impact of the brown marmorated stink bug (*Halyomorpha halys*) in Utah specialty crops. **Zachary Schumm** (zach.schumm@aggiemail.usu.edu), Diane Alston and Lori Spears, Utah State Univ., Logan, UT

11:20 Why is WSDA detecting apple maggot so late in the season? **Joshua Milnes** (jmlines@agr.wa.gov) and Michael Bush, Washington State Dept. of Agriculture, Yakima, WA

11:40 We found Japanese beetles in Idaho - and here's what we did. **Paul Castrovillo** (paul.castrovillo@isda.idaho.gov), Idaho State Department of Agriculture, Boise, ID

12:00 Rose stem girdler: An emerging pest of PNW rosaceae bramble crops. **Justin O'Dea** (justin.odea@wsu.edu), Washington State Univ., Vancouver, WA

12:20 Area-wide monitoring and integrated pest management of coffee berry borer (*Hypothenemus hampei*) on Hawaii Island. **Melissa Johnson** (melissa.johnson@usda.gov)¹ and Nicholas Manoukis², ¹USDA-ARS DKI US Pacific Basin Agricultural Research Center, Hilo, HI, ²USDA - ARS, Hilo, HI

12:40 Pathways of species invasion. **Clinton Campbell** (Clinton.L.Campbell@usda.gov), USDA, Federal Way, WA

1:00 Novel control strategy for *Bagrada hilaris* (Burmeister) on broccoli (*Brassica oleracea* var. *italica*). "Does *B. hilaris* prefer conventional grown broccoli over organic grown broccoli?" **Tasien Somé** (cppabmagronomy@gmail.com)¹, Aaron Fox², Anna Soper³ and Dawn Calibeo⁴, ¹Cal Poly Pomona, Pomona, CA, ²Michigan State Univ., East Lansing, MI, ³California State Polytechnic Univ., Pomona, CA, ⁴Univ. of Florida, Gainesville, FL

1:20 A behind the scenes look at Washington State's Asian giant hornet (*Vespa mandarinia*) response. **Sven-Erik Spichiger** (sspichiger@agr.wa.gov), Washington State Dept. of Agriculture, Olympia, WA

1:50 Case studies & tools for public engagement in the pest management process. **Alexis Haifley** (alexis.haifley@rco.wa.gov), Washington Invasive Species Council, Olympia, WA

Wednesday, April 7, 2021, Afternoon

Awards Session

Moderators and Organizers: Jacqueline Serrano¹ and Rebecca Schmidt-Jeffris², ¹USDA-ARS, Wapato, WA, ²USDA - ARS, Wapato, WA

2:30 PM - 4:00 PM

Habitat Diversity to Enhance Ecosystem Services in Perennial Cropping Systems

Moderators and Organizers: Houston Wilson and Robert Straser, Univ. of California, Riverside, Riverside, CA

4:00 Welcoming remarks

4:05 Use of native grasses for ecosystem services in vineyards. **Kent Daane** (kdaane@ucanr.edu)¹, Brian Hogg² and Houston Wilson³, ¹Univ. of California, Berkeley, Berkeley, CA, ²USDA - ARS, Albany, CA, ³Univ. of California, Riverside, Riverside, CA

4:25 Understanding and controlling grapevine red blotch virus vectors. **Alexis Billings** (billinac@berkeley.edu)¹, Kristen Flores¹, Kelsey McCalla², Houston Wilson³ and Kent Daane¹, ¹Univ. of California, Berkeley, Berkeley, CA, ²Univ. of California Berkeley, Brentwood, CA, ³Univ. of California, Riverside, Riverside, CA

4:45 Apple orchard herbicide strip manipulation affects predator abundance and movement. **Paul Bergeron** (paul.bergeron@wsu.edu)¹ and Rebecca Schmidt-Jeffris², ¹Washington State Univ., Wapato, WA, ²USDA - ARS, Wapato, WA

5:05 Canopy management and understory diversification in macadamia nut orchards to facilitate macadamia felted coccid biocontrol. **Mark Wright** (markwrig@hawaii.edu)¹ and Rosemary Gutierrez-Coarite², ¹Univ. of Hawai'i at Mānoa, Honolulu, HI, ²Univ. of Hawai'i at Manoa, Kahului, HI

5:25 Break

5:35 Increased pollinator habitat enhances cacao fruit set and predator conservation. Samantha Forbes¹ and **Tobin Northfield** (tnorthfield@wsu.edu)², ¹James Cook Univ., Cairns, Australia, ²Washington State Univ., Wenatchee, WA

5:55 Floral resource provisioning to enhance biological control of the western leaffooted bug, *Leptoglossus zonatus*, in tree nut crops. **Robert Straser** (rstra005@ucr.edu)¹, Judith Stahl², Kent Daane³ and Houston Wilson¹, ¹Univ. of California, Riverside, Riverside, CA, ²Univ. of California Berkeley, Parlier, CA, ³Univ. of California, Berkeley, Berkeley, CA

6:15 Cover crops affect conservation biological control of Heteropteran pests in pistachio. **Judith Stahl** (judithmstahl@gmail.com)¹, Robert Straser², Houston Wilson² and Kent Daane³, ¹Univ. of California Berkeley, Parlier, CA, ²Univ. of California, Riverside, Riverside, CA, ³Univ. of California, Berkeley, Berkeley, CA

6:35 Influence of cover crops on navel orangeworm in almond orchards. **Houston Wilson** (houston.wilson@ucr.edu)¹, Jessica Maccaro², Kent Daane³ and Amelie Gaudin⁴, ¹Univ. of California, Riverside, Riverside, CA, ²Univ. of California, Riverside, CA, ³Univ. of California, Berkeley, Berkeley, CA, ⁴Univ. of California, Davis, CA

6:55 Concluding remarks

The Fate to Chlorpyrifos in the United States and Beyond

Moderators and Organizers: Navneet Kaur and Silvia Rondon, Oregon State Univ., Corvallis, OR

4:00 Welcoming remarks

4:10 History of chlorpyrifos in the United States. **James Zahand** (jpszahand@outlook.com), James Zahand Consulting, Spokane-Coeur d'Alene Area, WA

4:35 Going ...going...gone! Regulating chlorpyrifos from existence in California. **David Haviland** (dhaviland@ucdavis.edu), Univ. of California, Bakersfield, CA

5:00 Impact of the Lorsban ban in onion in New York. **Brian Nault** (ban6@cornell.edu), Cornell AgriTech, Cornell Univ., Geneva, NY

5:25 Break

5:45 Managing cabbage maggot [*Delia radicum* (Linn.)]: Alternatives to chlorpyrifos. **Daniel Gilrein** (dog1@cornell.edu)¹ and Faruque Zaman^{2,3}, ¹Cornell Cooperative Extension of Suffolk County, Riverhead, NY, ²Cornell Cooperative Extension, Riverhead, NY, ³Rutgers Univ., Chatsworth, NJ

6:10 Alternatives to chlorpyrifos for the management of mealybugs in vineyards. **Kent Daane** (kdaane@ucanr.edu), Univ. of California, Berkeley, Berkeley, CA

6:35 Chlorpyrifos rulemaking process in Oregon. **Rose Kachadoorian** (rkachadoorian@oda.state.or.us), Oregon Dept. of Agriculture, Salem, OR

7:00 Alternatives to chlorpyrifos for insect control in vegetables in Washington state. **Timothy Waters** (twaters@wsu.edu), Washington State Univ., Pasco, WA

7:25 Concluding remarks

Wednesday, April 7, 2021, Evening

Final Business Meeting

Moderators and Organizers: Rebecca Schmidt-Jeffris¹ and Jacqueline Serrano², ¹USDA - ARS, Wapato, WA, ²USDA-ARS, Wapato, WA

8:15 PM - 9:15 PM

On-Demand

PB Graduate Student - Ph.D.

Insecticide resistance monitoring in California populations of alfalfa weevil (*Hypera postica*). **Madison Hendrick** (mlhendrick@ucdavis.edu)¹, Kevin Wanner² and Ian Grettenberger¹, ¹Univ. of California, Davis, CA, ²Montana State Univ., Bozeman, MT

Role of host and non-host plant volatile cues in host recognition and environmental safety assessments of the weevil *Mogulones crucifer*, a biocontrol agent of invasive plant *Cynoglossum officinale*. **Karuna Nepal** (knepal@uidaho.edu), Bradley Harmon, Sanford Eigenbrode and Mark Schwarzlaender, Univ. of Idaho, Moscow, ID

Soil arthropod communities influence root and shoot growth in winter pea and winter wheat. **Dane Elmquist** (elmqu059@gmail.com) and Sanford Eigenbrode, Univ. of Idaho, Moscow, ID

Using community science to quantify painted lady butterfly (*Vanessa cardui*) floral visitation across differing land cover types in Riverside County, California. **Jolene Saldivar** (saldivar.jolene@yahoo.com), Univ. of California, Riverside, Riverside, CA

Diversity and turnover of wild bee and ornamental plant assemblages in commercial plant nurseries. **Jacob Cecala** (jmcecala@gmail.com)¹ and Erin Wilson Rankin², ¹Univ. of California, Davis, Davis, CA, ²Univ. of California, Riverside, Riverside, CA

Native harvester ant likes invasive plants and changes plant species composition in endangered coastal sage scrub. **Rebecca Keim** (rkeim001@ucr.edu) and Richard Redak, Univ. of California, Riverside, CA

Histamine ingestion by *Anopheles stephensi* mosquito alters important vector transmission behavior and infection success with *Plasmodium yoelii*. **Anna Rodriguez** (amrodriguez@uidaho.edu)¹, Malayna Hambly¹, Sandeep Jandu², Jeff Riffell² and Shirley Luchhart¹, ¹Univ. of Idaho, Moscow, ID, ²Univ. of Washington, Seattle, WA

PB Graduate Student - M.S.

Abundance of two unevenly managed root-boring biological control agents for spotted knapweed in Idaho rangeland. **Samikshya Aryal** (arya5354@vandals.uidaho.edu)¹, Sanford Eigenbrode¹, Philip Weyl² and Mark Schwarzlaender¹, ¹Univ. of Idaho, Moscow, ID, ²CABI, Delémont, Switzerland

Olfactory and visual cues determine pre-alignment host selection of a biological control candidate. **Bijay Subedi** (bsubedi@uidaho.edu)¹, Bradley Harmon¹, Sanford Eigenbrode¹, Philip Weyl² and Mark Schwarzlaender¹, ¹Univ. of Idaho, Moscow, ID, ²CABI, Delémont, Switzerland

Specialized soil types affect host acceptability and performance of weed biocontrol candidates: Implications for host specificity assessments. **Sujan Panta** (sujanp@uidaho.edu)¹, Philip Weyl², Sanford Eigenbrode¹, Bradley Harmon¹ and Mark Schwarzländer¹, ¹Univ. of Idaho, Moscow, ID, ²CABI, Delémont, Switzerland

PB Undergraduate Student

Jumping into the future: An analysis of fifty years of flea data from urban wildlife. **Amanda Penicks** (amanda.k.penicks@gmail.com)¹, Laura Krueger¹, Daisy Rangel² and Robert Cummings², ¹Orange County Mosquito and Vector Control, Garden Grove, CA, ²Orange County Mosquito and Vector Control District, Garden Grove, CA

Submitted Posters

Transforming ESA awards: nominating excellence in 2021. **Rob Morrison** (william.morrison@usda.gov)¹, Isobel Ronai², Erin Cadwalader³ and Susan Weller⁴, ¹USDA - ARS, Manhattan, KS, ²Univ. of Sydney, Sydney, NSW, Australia, ³Entomological Society of America, Annapolis, MD, ⁴Univ. of Nebraska State Museum, Lincoln, NE

Herbicide impacts on orchard spiders. **Rebecca Schmidt-Jeffris** (Rebecca.Schmidt@usda.gov)¹, Erica Moretti², Paul Bergeron³ and Gabriel Zilnik⁴, ¹USDA - ARS, Wapato, WA, ²USDA-ARS, Wapato, WA, ³Washington State Univ., Wapato, WA, ⁴USDA-ARS, Maricopa, AZ

Flatheaded borer management in specialty tree crops, SCRI Project. **Nik G. Wiman** (nik.wiman@oregonstate.edu)¹, Jhalendra Rijal², Karla Adesso³, Jason Oliver³, Angelita Acebes⁴, Fulya Baysal-Gurel³, Brett Blaauw⁵, Ben Campbell⁵, Juang Horng Chong⁶, Amy Fulcher⁷, David Held⁸, Kimberly Jensen⁷, Shimat Joseph⁹, William Klingeman¹⁰, Anthony LeBude¹¹, Oscar Liburd¹², John Moulton⁷, Lloyd Nackley¹³, Cristi L. Palmer¹⁴, Clark Seavert¹, Erfan Vafaie¹⁵ and Anthony Witcher³, ¹Oregon State Univ., Corvallis, OR, ²Univ. of California Cooperative Extension, Modesto, CA, ³Tennessee State Univ., McMinnville, TN, ⁴Univ. of Georgia, Tifton, GA, ⁵Univ. of Georgia, Athens, GA, ⁶Clemson Univ., Florence, SC, ⁷Univ. of Tennessee, Knoxville, TN, ⁸Mississippi State Univ., Mississippi State, MS, ⁹Univ. of Georgia, Griffin, GA, ¹⁰Univ. of Tennessee, Knoxville, TN, ¹¹North Carolina State Univ., Mills River, NC, ¹²Univ. of Florida, Gainesville, FL, ¹³Oregon State Univ., Aurora, OR, ¹⁴Rutgers, The State Univ. of New Jersey, New Brunswick, NJ, ¹⁵Texas A&M Univ., Overton, TX

Documenting a biogeographic crossroads: The butterfly biodiversity in the Central Arizona Highlands. **Philip McNally** (philipmncally@gmail.com), centralarizonabutterflies.com, Prescott, AZ

Do field failures of bifenthrin against white clover seed weevil indicate resistance development? **Navneet Kaur** (Navneet.Kaur@oregonstate.edu)¹, Leanna Van Slambrook¹, Babu Panthi¹, Seth Dorman² and Nicole Anderson¹, ¹Oregon State Univ., Corvallis, OR, ²National Forage Seed Production Research Center-USDA-ARS, Corvallis, OR

Three years of adult armyworm area wide monitoring on rice: What we have learned. **Luis Espino** (laespino@ucanr.edu), Univ. of California Cooperative Extension, Oroville, CA

The impact of non-native insects on forest trees relies on different factors based on host tree specialization. **Kathryn Thomas** (kathryn_a_thomas@usgs.gov)¹, Ashley Schulz², Angela Mech³, Carissa Aoki⁴, Matthew Ayres⁵, Kamal J. K. Gandhi⁶, Nathan Havill⁷, Daniel Herms⁸, Andrew M. Liebhold⁹, Scott Maco¹⁰, Travis D. Marsico¹¹, Kenneth Raffa¹², Patrick Tobin¹³, Daniel Uden¹⁴ and Ruth Hufbauer¹⁵, ¹US Geological Survey, Tucson, AZ, ²Arkansas State Univ., Jonesboro, AR, ³Univ. of Maine, Orono, ME, ⁴Bates College, Lewiston, ME, ⁵Dartmouth College, Hanover, NH, ⁶Univ. of Georgia, Athens, GA, ⁷USDA - Forest Service, Hamden, CT, ⁸Davey Tree Expert Company, Kent, OH, ⁹USDA - Forest Service, Morgantown, WV, ¹⁰The Davey Tree Expert Company, Kent, OH, ¹¹Mississippi State Univ., Starkville, MS, ¹²Univ. of Wisconsin, Madison, WI, ¹³Univ. of Washington, Seattle, WA, ¹⁴Univ. of Nebraska-Lincoln, Lincoln, NE, ¹⁵Colorado State Univ., Fort Collins, CO

Floral scents and flower visitors of a global invader: *Anthemis cotula* L.. **Subodh Adhikari** (subodha@uidaho.edu)¹, Ian Burke² and Sanford Eigenbrode¹, ¹Univ. of Idaho, Moscow, ID, ²Washington State Univ., Pullman, WA

Filling life history gaps of the invasive *Adelges piceae* in the Intermountain West. **Elizabeth Rideout** (liz.rideout@usu.edu)¹, Grayson Jordan¹, Barbara J. Bentz², R. Justin DeRose³ and Diane Alston¹, ¹Utah State Univ., Logan, UT, ²USDA - Forest Service, Logan, UT, ³USDA, Forest Service, Rocky Mountain Research Station, Ogden, UT

Potential for interference competition between an introduced wool carder bee, *Anthidium manicatum*, and other pollinators. Tayler Gerken, Brooke Rogers, Jake Morton, Rachel Matheison, Austen Jack and **Gary Chang** (chang@gonzaga.edu), Gonzaga Univ., Spokane, WA

The efficacy of essential oils on amber snail mortality. **Christine Dodge** (christine.dodge@oregonstate.edu), Andrew Colton and Rory Mc Donnell, Oregon State Univ., Corvallis, OR

Management of the tadpole shrimp (*Triops longicaudatus*), a crustacean pest of CA rice: Insecticides, novel materials, application timing, and biological control. **Ian Grettenberger** (imgrettenberger@ucdavis.edu)¹, Kevin Goding¹ and Luis Espino², ¹Univ. of California, Davis, CA, ²Univ. of California Cooperative Extension, Oroville, CA