



*“Entomology in the Pacific Rim”*

**Pacific Branch  
Entomological Society  
Ninetieth Annual Meeting**

**March 5-8 2006  
Wailea Marriott Resort  
Maui, Hawaii**

**PACIFIC BRANCH  
ENTOMOLOGICAL SOCIETY OF AMERICA**

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*Future Meetings*

Marriott Waterfront, Portland, Oregon, March 23-28, 2007

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Sunday, March 5

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**Registration**

*Pavilion Lanai*

**Rob Hollingsworth, ARS-USDA, Hilo, HI**

2:00 - 7:00 P.M.

**Executive Committee Meeting**

*Room - Puakenikeni*

5:00 - 7:00 P.M.

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Monday, March 6

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**Registration**

*Pavilion Lanai*

**Rob Hollingsworth, ARS-USDA, Hilo, HI**

7:00 A.M. - 5:00 P.M.

**Opening Session and Preliminary Business Meeting**

*Room - Maile*

8:30 - 11:30 A.M.

- 8:30**            **Welcome and Opening Remarks,**  
**John Stark, President,** ESA Pacific Branch  
Washington State University, Puyallup, WA
- 8:40**            **Report for the National Organization,**  
**Frank Gilstrap,** President, Entomological Society of America  
Texas A & M, College Station, TX
- 9:00**            **Report for the Governing Board,**  
**Stephen Clement,** Representative, ESA Pacific Branch  
USDA-ARS, PIS, Pullman, WA
- 9:10**            **Introduction of the C.W. Woodworth Award,**  
“C.W. Woodworth, the Entomologist We Honor”  
**John Stark,** President, ESA Pacific Branch
- 9:15**            **“Historic Paper – A New Self-Regulating Paraffin Bath (1914)”**  
**Brian Holden,** Great-Grandson of C.W. Woodworth and  
Joann Wilfert, Award Donors
- 9:25**            **2006 C.W. Woodworth Award Winner Presentation,**  
“Deciphering Insect Communication Systems: A Long and Winding  
Road”  
**Jocelyn Millar,** University of California, Riverside, CA
- 10:00**           **2006 John Henry Comstock Award Winner Presentation,**  
“Variation in Female Sex Pheromone and Male Choice and No-Choice  
Assays in *Cadra cautella*”  
**Jeremy Allison,** University of California, Riverside, CA

- 10:25**            **Break**
- 10:45**            **Preliminary Business Meeting,**  
**John Stark**, President, ESA Pacific Branch
- 11:30**            **Adjourn**

### **Student Competition – Posters**

*Room - Jade*

11:00 A.M. – 5:00 P.M.

**Authors by Posters 11:00 A.M. – Noon, 1:00 – 2:00 P.M.**

Moderator: **Todd Shelly**, USDA-APHIS, Waimanalo, HI

### **MS Student Poster Competition**

- P-1**    Attractiveness of Pear Semiochemicals to Green Lacewings. **Robert T. Curtiss** and John E. Dunley. Washington State University, Tree Fruit Research and Extension Center, Wenatchee, WA.
- P-2**    Parasitoids of Green Peach Aphid (*Myzus persicae*) Sulzer and Bird Cherry-Oat Aphid (*Rhopalosiphum padi*) L.: Bioregulatory Value. **Jesse L. Fullbright**<sup>1</sup>, Keith S. Pike<sup>2</sup>, and George T. Graf<sup>2</sup>. <sup>1</sup>Washington State University, Department of Entomology, Pullman, WA, <sup>2</sup>Washington State University, Irrigated Agriculture Research and Extension Center, Prosser, WA.
- P-3**    An Educational Program for Native Hawaiian High School Students to Stimulate Interest in Careers in Entomology. **Margaret C. Gentz**<sup>1</sup>, David Sing<sup>2</sup>, Kinohi Gomes<sup>2</sup>, Tamar DeFries<sup>2</sup>, Kaleo Manuel<sup>2</sup>, and J. Kenneth Grace<sup>1</sup>. <sup>1</sup>University of Hawaii, Plant and Environmental Protection Sciences, Honolulu, HI, <sup>2</sup>University of Hawaii, Na Pua Noeau, Queen Liliuokalani Center for Student Services, Honolulu, HI.
- P-4**    Agonistic Interactions Among Invasive Ant Species in Hawaii. **Ranit Kirschenbaum** and J. Kenneth Grace. University of Hawaii at Manoa, Department of Plant and Environmental Protection Sciences, Honolulu, HI.
- P-5**    Growth and Development of Peelminer, *Marmara gulosa* (Guillen and Davis) (Lepidoptera:Gracillariidae) in California Citrus. **Melissa J. O’Neal** and David H. Headrick. California State Polytechnic University, Horticulture and Crop Science Department, San Luis Obispo, CA.
- P-6**    Insect Community Survey Pre and Post Catastrophic Event in an Irrigated Perennial Crop. **Andrew Rodstrom**, Eugene Hannon, Neal Kittelson, and John J. Brown. Washington State University, Department of Entomology,

Pullman, WA.

- P-7** The Efficacy of Biological Control Against Yellow Star Thistle in the Hell's Canyon Ecosystem. **Rachel L. Winston** and Mark Schwarzlander. University of Idaho, Department of Plant, Soil, and Entomological Sciences, Moscow, ID.
- P-8** Behavioral Evidence for Host-Race Formation in the Gall Midge (*Dasineura folliculi*) (Diptera: Cecidomyiidae). **Eric R. Scott**<sup>1</sup>, Netta Dorchin<sup>2</sup>, and Warren G. Abrahamson<sup>2</sup>. <sup>1</sup>Whitman College, Walla Walla, WA, <sup>2</sup>Bucknell University, Department of Biology, Lewisburg, PA.
- P-9** Implications for Biocontrol of Tansy Ragwort. **Marianna Szucs**<sup>1</sup>, Cort L. Anderson<sup>2</sup>, and Mark Schwarzlander<sup>1</sup>. <sup>1</sup>University of Idaho, Department of Plant, Soil, and Entomological Sciences, Moscow, ID, <sup>2</sup>University of Idaho, Department of Fish and Wildlife Resources, Moscow, ID.
- P-10** Sexual Behavior of Naïve and Previously Mated Hairy Woodpecker Bugs, *Murgantia histrionica*. **Deane K. Zahn** and Jocelyn G. Millar. University of California, Department of Entomology, Riverside, CA.

#### PhD Student Poster Competition

- P-11** Multi-Response Permutation Procedures, the Assumption of Homogeneity of Variances and Trap Catch Data. **Jeremy D. Allison**, Richard A. Redak and Ring T. Cardé. University of California, Department of Entomology, Riverside, CA.
- P-12** Relative Abundance of Native and Invasive Spiders in California Vineyards and Surrounding Natural Ecosystems. **Brian N. Hogg**, Kent M. Daane, and Rosemary G. Gillespie. University of California Berkeley, Department of Environmental Science, Policy, and Management, Berkeley, CA.
- P-13** Environmental Factors Influencing the Parasitoid Community of *Udea stellata* (Crambidae) in Hawaii. **Leyla V. Kaufman** and Mark G. Wright. University of Hawaii at Manoa, Department of Plant and Environmental Protection Sciences, Honolulu, HI.
- P-14** Phylogenetic Placement of Six Pentatomid Caeca-Associated Symbionts. **Simone S. Prado**<sup>1</sup>, Daniel Rubinoff<sup>1</sup> and Rodrigo Almeida<sup>2</sup>. <sup>1</sup>University of Hawaii at Manoa, Department of Plant and Environmental Protection Sciences, Honolulu, HI, <sup>2</sup>University of California Berkeley, Department of Environmental Science, Policy and Management, Berkeley, CA.
- P-15** Testing the Host Specificity of *Anagrus epos* and Development of a Rearing Method Using Beet Leafhopper. **Rodrigo Krugner**, University of California,

Department of Entomology, Riverside, CA.

## General Poster Session

*Room – Jade*

11:00 A.M. – 5:00 P.M.

**Authors by Posters 11:00 A.M. – Noon, 1:00 – 2:00 P.M.**

Moderator: **Todd Shelly**, USDA-APHIS, Waimanalo, HI

### *Section A*

- P-16** Insects Collected by Youth at the 1<sup>st</sup> and 2<sup>nd</sup> Annual Big Island Insect Count in Volcano National Park Sponsored by the Hawaiian Entomological Society. **E.R. Easton**<sup>1</sup>, Robert E. Hollingsworth<sup>2</sup>, David Foote<sup>3</sup>, and Karl N. Magnacca<sup>3</sup>.  
<sup>1</sup>University of Hawaii at Manoa, Honolulu, HI, <sup>2</sup>USDA-ARS, Hilo, HI,  
<sup>3</sup>U.S. Geological Survey, Pacific Islands Ecosystem Research Center, Volcano, HI.

### *Section B*

- P-17** Wheat Germ Oil and a Low Waste Liquid Larval Diet for Rearing Oriental Fruit Flies (Diptera:Tephritidae). **Chiou Ling Chang**<sup>1</sup>, Rebecca L. Heinig<sup>1</sup>, and Roger I. Vargas<sup>2</sup>. <sup>1</sup>USDA-ARS, Pacific Basin Agricultural Research Center, Honolulu, HI, <sup>2</sup>USDA-ARS, Pacific Basin Agricultural Research Center, Hilo, HI.

### *Section C*

- P-18** Augmentative Biological Control of Tephritid Fruit Flies: Successes, Pitfalls and Prospects. **Avi Eitam** and Roger I. Vargas. USDA-ARS, Pacific Basin Agricultural Research Center, Hilo, HI.
- P-19** Inheritance of the Orange Body Color Trait in *Nezara viridula F. aurantiaca* species name (Hemiptera:Pentatomidae). **Peter A. Follett**, F. Calvert, and M. Golden. USDA-ARS, Pacific Basin Agricultural Research Center, Hilo, HI.
- P-20** Biological Control of Cherry Bark Tortrix, *Enarmonia formosana* Scopoli in the Pacific Northwest. **Beverly S. Gerdeman**<sup>1</sup> and Lynell K. Tanigoshi<sup>1</sup>.  
<sup>1</sup>Washington State University, Vancouver Research and Extension Unit, Vancouver, WA.
- P-21** Seasonal Feeding Patterns of *Nezara viridula* in Macadamia Nut. **Mary Golden**, Peter Follett, and Mark Wright. USDA-ARS, Pacific Basin Agricultural Research Center, Hilo, HI.



- P-22** Gustatory and Olfactory Responses of *Lygus hesperus* Exposed to Artificial Diets Containing Potassium Chloride. **James Hagler** and Jacquelyn Blackmer. USDA-ARS, Western Cotton Research Laboratory, Phoenix, AZ.
- P-23** Estimates of Seed Production Loss in Wild Plant Populations by Captivorous Fruit Flies (Diptera: Tephritidae). **Robert L. Johnson** and Val Jo Anderson. Brigham Young University, Department of Integrative Biology, Provo, UT.
- P-24** Too Little – Too Late???? *Rhyzobius lophanthae* Introduced Against Asian Cycad Scale, *Aulacaspis yasumatsui*, on Guam. **Ross H. Miller**<sup>1</sup>, A. Moore<sup>1</sup>, R.N. Muniappan<sup>1</sup>, A.P. Brooke<sup>2</sup>, and T.E. Marler<sup>1</sup>. <sup>1</sup>University of Guam, CNAS-AES, Mangilao, Guam, <sup>2</sup>Guam National Wildlife Refuge, Dededo, Guam.
- P-25** Effects of Vector Preference for Healthy or Infected Plants on the Spread of a Plant Pathogen. **Mark S. Sisterson**. USDA-ARS, San Joaquin Valley Agricultural Sciences Center, Parlier, CA.
- P-26** Evaluation of Wildflower Refuge Plantings for Integrated Weed and Insect Control. **Amanda M. Snyder**<sup>1</sup>, Robert S. Gallagher<sup>2</sup>, William E. Snyder<sup>3</sup>. <sup>1</sup>Washington State University, Department of Crop and Soil Sciences, Pullman, WA, <sup>2</sup>Pennsylvania State University, Department of Crop and Soil Sciences, University Park, PA, <sup>3</sup>Washington State University, Department of Entomology, Pullman, WA.

### Symposium: Mitigating Pacific Rim Invasions

Room – Haku

1:00 – 5:00 P.M.

Organizer and Moderator: **Victoria Y. Yokoyama**  
 USDA-ARS, San Joaquin Valley Agricultural Sciences Center  
 Parlier, CA

- 1:00** Introduction. **Victoria Y. Yokoyama**
- 1:02**        **1**        A Brief History of Introduced and Invasive Species in Hawaii. **Mindy Wilkinson**. Hawaii Department of Land and Natural Resources, DOFAW, Honolulu, HI.
- 1:22**        **2**        How to Achieve Prevention of Biological Invasions that are Rapidly Eroding Hawaii’s Native Biological Diversity? **Lloyd L. Loope**. USGS, Haleakala Field Station, Makawao, HI.
- 1:42**        **3**        Second Commercial Irradiator Proposed For Hawaii. **Lyle Wong**. Hawaii Department of Agriculture, Honolulu, HI.
- 2:02**        **4**        Immediate Management of New Invasive Species in Hawaii.

**Arnold H. Hara**, Christopher M. Jacobsen, and Ruth Y. Niino-Duponte. University of Hawaii at Manoa, Beaumont Agricultural Research Center, Hilo, HI.

- 2:22**        **5**        Postharvest Quarantine Treatments to Prevent the Spread of Hawaii's Pests to the Pacific Rim. **Peter A. Follett**. USDA-ARS, Hilo, HI.
- 2:42**        **6**        Off-Shore Quarantine Research Programs (Or, "Why Wait 'Til They Get Here?!"). **John W. Armstrong**. USDA-ARS, Hilo, HI.
- 3:02**        Break
- 3:17**        **7**        California Pest Invasions: Composition, Origins, Impacts and Regulatory Response. **Robert V. Dowell**. CDFR, Sacramento, CA.
- 3:37**        **8**        Proactive Research to Prevent the Interruption of Trade with the Advance of Invasive Species. **Victoria Y. Yokoyama**. USDA-ARS, San Joaquin Valley Agricultural Sciences Center, Parlier, CA
- 3:57**        **9**        Introduction of the Parasitoid, *Fopius arisanus* (Sonan), into French Polynesia for Suppression of Oriental Fruit Fly. **R.I. Vargas**, L. LeBlanc, and R. Putoa. USDA-ARS, Pacific Basin Agricultural Research Center, Hilo, HI.
- 4:17**        **10**      Lucid Identification Key to the Stages and Genera of the Aleyrodidae (Hemiptera-Sternorrhyncha). **John W. Dooley**. USDA-APHIS, South San Francisco, CA.
- 4:37-5:00**      Discussion

**Symposium: Chemical Ecology – Discoveries and Applications in the Pacific States**

*Room – Maile  
1:00 – 5:00 P.M.*

Organizers: **Leonardo De A. Camelo**, **Christelle Guedot**,  
**Peter J. Landolt**, **Richard S. Zack**  
Moderator: **Leonardo De A. Camelo**  
Washington State University, Pullman, WA

**1:00**        Introduction, **Leonardo Camelo**

- 1:05**      **11**      Models and Methods in Chemical Ecology. **John A. Byers.** USDA-ARS, US Arid-Land Agricultural Research Center, Maricopa, AZ.
- 1:25**      **12**      How do the Patterns of Temporal and Spatial Contact with an Odorant Modulate Behavioral Response? **Ring T. Carde.** University of California, Department of Entomology, Riverside, CA.
- 1:45**      **13**      A Volatile Sex Pheromone in *Prionus Californicus* (Mots) (Coleoptera: Cerambycidae) Beetles. **Daniel E. Cervantes<sup>1</sup>**, Emerson S. Lacey<sup>2</sup>, Lawrence M. Hanks<sup>2</sup>, Jocelyn G. Millar<sup>3</sup> and James D. Barbour<sup>1</sup>. <sup>1</sup>University of Idaho, Department of Soil and Entomological Sciences, Parma, ID, <sup>2</sup>University of Illinois, Department of Entomology, Urbana, IL, <sup>3</sup>University of California-Riverside, Department of Entomology, Riverside, CA.
- 2:05**      **14**      Chemical Ecology of Pear Psylla, *Cacopsylla pyricola* (Homoptera: Psyllidae). **Christelle Guedot**, David R. Horton, and Peter J. Landolt. USDA-ARS, Yakima Agricultural Research Laboratory, Wapato, WA.
- 2:25**      **15**      7,9-Decadienoates: Sex Pheromone Components of the Nettle Moth, *Darna pallivitta* (Moore). **Eric B. Jang<sup>1</sup>**, Matthew Siderhurst<sup>1</sup>, Arnold H. Hara<sup>2</sup>, Patrick Conant<sup>3</sup>, Janice T. Nagata<sup>1</sup>, Esther L. Schneider<sup>1</sup>, and Lori A. Carvalho<sup>1</sup>. <sup>1</sup>USDA-ARS, Pacific Basin Agricultural Research Center, Hilo, HI, <sup>2</sup>University of Hawaii at Manoa, CTAHR, Hilo, HI, <sup>3</sup>Hawaii Department of Agriculture, Hilo, HI.
- 2:45**      **16**      Cucumber Volatile Blend Attractive to Female Melon Fly, *Bactrocera cucurbitae* Coquillett. **Matthew S. Siderhurst**, Eric B. Jang, Janice T. Nagata, and Lori A. Carvalho. USDA-ARS, Pacific Basin Agricultural Research Center, Hilo, HI.
- 3:05**      Break
- 3:20**      **17**      Response of *Myzus persicae* to Potato Volatiles: Deciphering the Effects of *Potato Leaf Roll Virus* Infection. **Sanford D. Eigenbrode<sup>1</sup>**, Esther Ngumbi<sup>1</sup>, Hongjian Ding<sup>1</sup>, Thomas M. Mowry<sup>2</sup>, Analiz Rodriguez<sup>1</sup> and Brent Werner<sup>1</sup>. <sup>1</sup>University of Idaho, Division of Entomology, Moscow, ID, <sup>2</sup>University of Idaho, Parma Research and Extension Center, Parma, ID.
- 3:40**      **18**      Manipulating Plant-Arthropod Conversations to Improve

Conservation Biological Control. **David G. James**, Sandra C. Castle del Conte, Tanya S. Price, Tessa Grasswitz, Victor Reyna, Lawrence C. Wright, Joe Perez, Oscar Garcia and Deborah Brooks. Washington State University, Department of Entomology, Prosser, WA.

- 4:00**      **19**      Development and Adoption of Pheromone Technology for Management of Key Pests in Washington Apple Orchards. **Jay F. Brunner**, John E. Dunley, Elizabeth Beers, Vince P. Jones and Mike Doerr. Washington State University, Tree Fruit Research and Extension Center, Wenatchee, WA.
- 4:20**      **20**      Chemistry and Applications of New Mealybug Pheromones. **Jocelyn G. Millar**<sup>1</sup>, Stephen McElfresh<sup>1</sup>, Kent M. Daane<sup>2</sup>, Walter J. Bentley<sup>3</sup>, and Jardel Moreira<sup>1</sup>. <sup>1</sup>University of California, Department of Entomology, Riverside, CA, <sup>2</sup>University of California, Division of Insect Biology, Center for Biological Control, Berkeley, CA, <sup>3</sup>University of California Integrated Pest Management Program, Parlier, CA.
- 4:40**      Adjourn

**Symposium: Agroecology in Context: Insects and Plants in Production and Conservation**

*Room – Pikake  
1:00-3:20 P.M.*

Organizer and Moderator: **John Banks**  
University of Washington, Tacoma, WA

- 1:00**      Introduction, John Banks
- 1:05**      **21**      Natural Vegetation within and Around Agroecosystems – Effects on Insect Population Dynamics and Diversity. **John E. Banks**. University of Washington, Environmental Science, Interdisciplinary Arts and Sciences, Tacoma, WA.
- 1:25**      **22**      Links Between Agricultural Crops and Natural Areas: Habitat Selection of Insect Predators. **Edward W. Evans**. Utah State University, Department of Biology, Logan, UT.
- 1:45**      **23**      Predator Biodiversity Strengthens Biological Control. **William E. Snyder**<sup>1</sup>, Gretchen B. Snyder<sup>1</sup>, Deborah L. Finke<sup>1</sup>, and Cory Straub<sup>2</sup>. <sup>1</sup>Washington State University, Department of Entomology, Pullman, WA.

- 2:05**            **24**      Effect of Coffee Farm Diversity on Harvesting of Coffee by the Leaf-Cutting Ant, *Atta cephalotes*. **Edgar Varon**<sup>1,2</sup>, Sanford D. Eigenbrode<sup>1</sup>, Nilsa A. Bosque-Perez<sup>1</sup>, Luko Hilje<sup>2</sup>, J. Jones<sup>2</sup>, and Penelope Morgan<sup>3</sup>. <sup>1</sup>University of Idaho, Department of Plant, Soil and Entomological Sciences, Moscow, ID, <sup>2</sup>CATIE, Turrialba, Costa Rica, <sup>3</sup>University of Idaho, Department of Forest Resources, Moscow, ID.
- 2:25**            **25**      Claiming Uncertainty: Filling Data Gaps in Risk Assessment of Transgenic Bt Crops. **Joy A. Hagen** and Deborah K. Letourneau. University of California, Department of Environmental Studies, Santa Cruz, CA.
- 2:45**            **26**      The Grape Agroecosystem: How Cultural Practices Can Affect Arthropod Density in Vineyards. **Michael Costello**, California Polytechnic State University, San Luis Obispo, CA.
- 3:05-3:20**            Discussion

**Symposium: Graduate Student Symposium  
Session 1**

*Room – Pikake  
3:30 – 5:30 P.M.*

Moderator: **Carol Anelli**  
Washington State University, Pullman, WA

**3:30**            Introduction, **Carol Anelli**

**MS Student Oral Presentations**

- 3:32**            **27**      The Search For Existing Natural Enemies of *Darna pallivitta* Moore (Lepidoptera: Limacodidae) Existing In Hawaii. **Christopher Kishimoto**<sup>1</sup>, Arnold Hara<sup>2</sup>, Stacey Chun<sup>2</sup>, Walter Nagamine<sup>3</sup>, Patrick Conant<sup>4</sup> and Clyde Hirayama<sup>4</sup>. <sup>1</sup>University of Hawaii at Manoa, Department of Plant and Environmental Protection Sciences, Honolulu, HI, <sup>2</sup>University of Hawaii at Manoa, Department of Plant and Environmental Protection Sciences, Beaumont Agricultural Research Center, Hilo, HI, <sup>3</sup>Hawaii State Department of Agriculture, Honolulu, HI, <sup>4</sup>Hawaii State Department of Agriculture, Hilo, HI.
- 3:44**            **28**      Within-Plant Spatial Distribution and Binomial Sampling of Banana Aphid (*Pentalonia nigronervosa* Coquerel) in Hawaii. **Jacqueline D. Robson**<sup>1</sup>, Mark G. Wright<sup>1</sup>, and Rodrigo P.P. Almeida<sup>2</sup>. <sup>1</sup>University of Hawaii at Manoa, Department of Plant

and Environmental Protection Sciences., Honolulu, HI, <sup>2</sup>University of California, Department of Environmental Science, Policy and Management, Berkeley, CA.

### PhD Oral Presentations

- 3:56**        **29**        Multi-Genome Evidence for Host Associated Species in the Aphid Genus *Hyalopterus*. **Jeffrey D. Lozier**, Nicholas J. Mills, and George K. Roderick. University of California, Department of Environmental Science, Policy and Management, Berkeley, CA.
- 4:08**        **30**        Exploring Disharmony of Hawaiian Lepidoptera: Colonization and Adaptive Radiation. **William P. Haines** and Daniel Rubinoff. University of Hawaii, Department of Plant and Environmental Protection Sciences, Honolulu, HI.
- 4:20**        **31**        Synovigeny in Two *Metaphycus* Species: A Comparative Study. **A. Kapranas** and R.F. Luck. University of California, Department of Entomology, Riverside, CA.
- 4:32**        **32**        Mercury Affects Selenium Speciation and Bioaccumulation in *Culex quinquefasciatus* and *Sympetrum corruptum*. **Peter D. Jensen**<sup>1</sup>, Ingrid Pickering<sup>2</sup>, William E. Walton<sup>1</sup>, and John T. Trumble<sup>1</sup>. <sup>1</sup>University of California, Department of Entomology, Riverside, CA, <sup>2</sup>University of Saskatchewan, Geological Sciences, Saskatoon, Canada.
- 4:44**        **33**        Genetic Factors Affecting the Evolution of Resistance to Pyriproxyfen by the Sweetpotato Whitefly. **David Crowder**. University of Arizona, Department of Entomology, Tucson, AZ.
- 4:56**        **34**        Concurrent Positive, Negative, and Neutral Effects of Predator Diversity on Herbivores. **Cory S. Straub** and William E. Snyder. Washington State University, Department of Entomology, Pullman, WA.
- 5:08**        **35**        Influence of Hairy Nightshade, *Solanum sarrachoides*, on Potato Leafroll Virus Disease Spread. **Rajagopalbabu Srinivasan**<sup>1</sup>, Juan Manuel Alvarez<sup>1</sup>, Nilsa A. Bosque-Perez<sup>2</sup> and Sanford D. Eigenbrode<sup>2</sup>. <sup>1</sup>University of Idaho, Department of Plant Soil and Entomological Sciences, W. Aberdeen, ID, <sup>2</sup>University of Idaho, Department of Plant Soil and Entomological Sciences, Moscow, ID.
- 5:20**               Adjourn

**Mixer and President's Reception**

*Pacific Terrace*  
*5:00 – 7:00 P.M.*

**Linnaean Games**

*7:00 – 9:00 P.M.*  
*Room – Maile*

Moderator: **Sue Blodgett**,  
Montana State University, Bozeman, MT

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Tuesday, March 7

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**Registration**  
*Pavilion Lanai*  
**Rob Hollingsworth, ARS-USDA, Hilo, HI**  
7:00 A.M. - Noon

**General Poster Session**

*Room - Jade*

9:00 A.M. – 5:00 P.M.

**Authors by Posters 11:00 A.M. – Noon, 1:00 – 2:00 P.M.**

Moderator: **Don McInnis**, USDA-ARS, Honolulu, HI

*Section E*

- P-27** Novel Measurement of Group Adoption of IPM in Diverse Communities. **Peter C. Ellsworth**<sup>1</sup>, John C. Palumbo<sup>2</sup>, Al Fournier<sup>1</sup>, Yves Carriere<sup>3</sup>, and Christa Eilers-Kirk<sup>3</sup>. <sup>1</sup>University of Arizona, Department of Entomology, Maricopa, AZ, <sup>2</sup>Arizona Pest Management Center, Yuma, AZ. <sup>3</sup>University of Arizona, Tucson, AZ.
- P-28** University of California Water Quality Program to Assist Nursery Growers in Reducing Pesticide Runoff. **Julie Newman**<sup>1</sup>, Kristine Gilbert<sup>1</sup>, Dale Zurawski<sup>1</sup>, Amy Ellis<sup>1</sup>, Ben Farber<sup>1</sup>, Jan Gan<sup>2</sup>, Laosheng Wu<sup>2</sup>, Don Merhaut<sup>3</sup>. <sup>1</sup>University Of California Cooperative Extension, Ventura, CA, <sup>2</sup>University of California, Department of Environmental Sciences, Riverside, CA, <sup>3</sup>University of California, Department of Botany and Plant Sciences, Riverside, CA.
- P-29** Cross-Commodity Guidelines for Neonicotinoid Insecticides in Arizona. **John C. Palumbo**<sup>1</sup>, Peter C. Ellsworth<sup>2</sup>, Al Fornier<sup>2</sup>, Timothy J. Dennehy<sup>3</sup>, and Robert L. Nichols<sup>4</sup>. <sup>1</sup>University of Arizona, Department of Entomology, Yuma, AZ, <sup>2</sup>Arizona Pest Management Center, Maricopa, AZ, <sup>3</sup>University of Arizona, Department of Entomology, Tucson, AZ, <sup>4</sup>Cotton Incorporated, Cary, NC.
- P-30** Towards Establishing an Effective Quarantine for Glassy-Winged Sharpshooters in Ornamental Nursery Crops. **Richard A. Redak** and James A. Bethke. University of California, Department of Entomology, Riverside, CA.

*Section F*



- P-31** Developing a New Management Plant for Vector-virus of Potatoes in Idaho. **Juan M. Alvarez**, Rajagopalbabu Srinivasan and Pamela J.S. Hutchinson. University of Idaho, Aberdeen Research and Extension Center, Aberdeen, ID.
- P-32** Grazing Intensity on Black Grass Bug (Hemiptera: Miridae; *Labops hesperius* Uhler, *Irbisia* spp.) Abundance in Montana Wheatgrass Pastures. **Sue Blodgett**<sup>1</sup>, Kevin O'Neill<sup>2</sup>, Bret Olsen<sup>1</sup> and Richard Miller<sup>2</sup>. <sup>1</sup>Montana State University, Department of Animal and Range Sciences, Bozeman, MT, <sup>2</sup>Montana State University, Department of Land Resources and Environmental Sciences, Bozeman, MT.
- P-33** Integrated Pest Management in Hybrid Poplar Plantings. **John J. Brown**<sup>1</sup>, Eugene R. Hannon<sup>1</sup>, Neal T. Kittelson<sup>1</sup>, R. Andrew Rodstrom<sup>1</sup>, and Douglas B. Walsh<sup>2</sup>. <sup>1</sup>Washington State University, Department of Entomology, Pullman, WA, <sup>2</sup>Washington State University, Irrigated Agriculture Research and Extension Center, Prosser, WA.
- P-34** A Microsporidium Infecting the Black Vine Weevil, *Otiiorhynchus sulcatus* (F.) (Coleoptera: Curculionidae). **Denny J. Bruck**<sup>1</sup> and Leellen Solter<sup>2</sup>. <sup>1</sup>USDA-ARS Horticultural Crops Research Laboratory, Corvallis, OR, <sup>2</sup>Illinois Natural History Survey, Champaign, IL.
- P-35** Control of the Two Spotted Spider Mite (*Tetranychus urticae*) on Dry Beans in California. **Mick Canevari** and Randall Wittie. University of California, Cooperative Extension, Stockton, CA.
- P-36** The Development of an IPM Program for the Management of Pepper Plant Pests. **William G. Carson**, Gregory S. Kund, and John T. Trumble. University of California, Department of Entomology, Riverside, CA.
- P-37** Potato Tuberworm, *Phthorimaea operculella* (Zeller), in Idaho. **Eric J. Dotseth** and Juan M. Alvarez. University of Idaho, Aberdeen Research and Extension Center, Aberdeen, ID.
- P-38** Attract-and-Kill Bait Stations Successfully Reduce Cutworm Numbers in Washington Grape Vineyards, 2003-2005. **Holly Ferguson**, Douglas Walsh, Tim Waters, and Ron Wright. Washington State University, Irrigated Agriculture Research and Extension Center, Prosser, WA.
- P-39** Combating European Asparagus Aphid (*Brachycorynella asparagi*) Infestations in Northern California. **Calvin Benny Fouche** and Debra Boelk. University of California Cooperative Extension, Stockton, CA.
- P-40** Pear Rust Mites: Alternatives to Carzol: 2005. **Bruce M. Greenfield**, John E. Dunley, Tara M. Madsen and Keith R. Granger. Washington State University, Tree Fruit Research and Extension Center, Wenatchee, WA.

- P-41** Mating Disruption for Suppression of Navel Orangeworm Damage in Almonds. **Bradley S. Higbee**<sup>1</sup>, Charles S. Burks<sup>2</sup>, and David G. Brandl<sup>2</sup>. <sup>1</sup>Paramount Farming Company, Bakersfield, CA, <sup>2</sup>USDA-ARS, Parlier, CA.
- P-42** A New Extension Bulletin: Using Pear Ester to Monitor Codling Moth in Sex Pheromone-Treated Orchards. **Alan L. Knight**<sup>1</sup>, R.J. Hilton<sup>2</sup>, P.D. VanBuskirk<sup>2</sup>, and D.M. Light<sup>3</sup>. <sup>1</sup>USDA-ARS, Wapato, WA, <sup>2</sup>SOREC-Oregon State University, Central Point, OR, <sup>3</sup>USDA-ARS, Albany, CA.
- P-43** Management of Codling Moth with ULV Ground Applications of Asana: Lethal and Sublethal Effects. **Alan L. Knight**. USDA-ARS, Wapato, WA.
- P-44** Design and Implementation of an IPM Program for Commercial Tomato Production. **Gregory S. Kund**, William G. Carson, and John T. Trumble. University of California, Department of Entomology, Riverside, CA.
- P-45** Larval “Bait Spray” and Augmented Mating Disruption Control of Codling Moth Using the Pear Ester Kairomone in California. **Douglas M. Light**. USDA-ARS, Western Regional Research Center, Albany, CA.
- P-46** Looking for Biological Control of Pear Psylla. **Tara M. Madsen** and John E. Dunley. Washington State University, Tree Fruit Research and Extension Center, Wenatchee, WA.
- P-47** Insecticide Bait Formula Evaluated for Darkling Ground Beetles, *Blapstinus spp.* (Coleoptera: Tenebrionidae) Control. **Eric Natwick**<sup>1</sup>, Ron Cardoza<sup>1</sup>, Martin Lopez<sup>1</sup>, and Robert Behle<sup>2</sup>. <sup>1</sup>University of California Cooperative Extension, Holtville, CA, <sup>2</sup>USDA-ARS-NCAUR, Peoria, IL.
- P-48** Assessment of Alfalfa Weevil Damage in California Alfalfa. **Steve Orloff**<sup>1</sup>, Larry Godfrey<sup>2</sup>, Karey Windbiel-Rojas<sup>2</sup>, Richard Lewis<sup>2</sup>, Dan Putnam<sup>3</sup>, Mick Canevari<sup>1</sup>, Carol Frate<sup>1</sup>, Dan Marcum<sup>1</sup>, and Jerry Schmierer<sup>1</sup>. <sup>1</sup>University of California Cooperative Extension, Siskiyou, San Joaquin, Tulare, Shasta, and Colusa Counties, <sup>2</sup>University of California, Department of Entomology, Davis, CA, <sup>3</sup>University of California, Plant Sciences Department, Davis, CA.
- P-49** Can Adjuvants Improve Efficacy of Organic Insecticides? Control of *Macrosiphum euphorbiae* on Fresh Market Tomatoes. **Corin G. Pease** and Frank G. Zalom. University of California, Department of Entomology, Davis, CA.
- P-50** Control of Beet Armyworm, *Spodoptera exigua* (Huber), with Reduced-Risk Insecticides in California Strawberries. **Pat Thompson**<sup>1</sup>, Frank Zalom<sup>1</sup> and Kirk Larson<sup>2</sup>. <sup>1</sup>University of California, Department of Entomology, Davis, CA, <sup>2</sup>University of California, South Coast Research and Extension Center, Irvine, CA.

- P-51** Achieving Clarity: Digitizing the Aphids of the Hawaiian Islands. **Michelle N. Tremblay**<sup>1</sup>, Edward B. Mondor<sup>1</sup>, Russell H. Messing<sup>1</sup>, Robert G. Foottit<sup>2</sup>, and Keith S. Pike<sup>3</sup>. <sup>1</sup>University of Hawaii at Manoa, Kauai Agricultural Research Center, Kapaa, HI, <sup>2</sup>Agriculture and Agri-Food Canada, Eastern Cereal and Oilseed Research Centre, Ottawa, Canada, <sup>3</sup>Washington State University, Irrigated Agriculture Research and Extension Center, Prosser, WA.
- P-52** Cotton Aphid Control Studies in Tulare County, California. **Steve Wright**, Gerardo Banuelos, Sarah Hutmacher, John Soares, Jeanette Elam. University of California Cooperative Extension, Tulare, CA.

**Symposium: Graduate Student Symposium  
Session 2**

*Room – Maile*  
8:00 – 11:00 A.M.

Moderator: **Carol Anelli**  
Washington State University, Pullman, WA

**PhD Oral Presentations**

- 8:00**            **36**        Bio-Ecology and Biometrical Analysis of *Spodoptera litura* Fabricius in Castor in India. **Ajay B. Maghodia** and D.J. Koshiya. Anand Agricultural University, Department of Entomology, Gujarat State, India.
- 8:12**            **37**        Gradient Sensitivity of Female Color Morphs to Temperature in the Damselfly *Megalagrion calliphya* (Odonata: Coenagrionidae). **Idelle A. Cooper**<sup>1</sup>, David Foote<sup>2</sup>, and Lori Tango<sup>3</sup>. <sup>1</sup>Department of Biology, Indiana University, Bloomington, IN, <sup>2</sup>U.S. Geological Survey, Pacific Island Ecosystem Research Center, Hawaii National Park, HI, <sup>3</sup>Pacific Cooperative Studies Unit, University of Hawaii at Manoa, Honolulu, HI.
- 8:24**            **38**        FYI on a Disappearing Hawaiian Endemic Oddity: A Cold Tolerant Predaceous Seed Bug (*Nysius wekiuicola*). **Jesse A. Eiben** and Daniel Rubinoff. University of Hawaii at Manoa, Department of Plant and Environmental Protection Sciences, Honolulu, HI.
- 8:36**            **39**        Honeydew and Honey Don't-The Variable Impacts of Invasive Ants on Hawaiian Bugs. **Paul D. Krushelnycky** and Rosemary G. Gillespie. University of California, Division of Insect Biology,

Department of Environmental Science, Policy and Management,  
Berkeley, CA.

- 8:48**      **40**      Investigation of Attraction of Non-Target Organisms to Fruit Fly Female Attractants and Male Lures on Hawaii Island. **Luc Leblanc**<sup>1</sup>, Roger Vargas<sup>2</sup>, and Daniel Rubinoft<sup>1</sup>. <sup>1</sup>University of Hawaii, CTAHR-PEPS, Honolulu, HI, <sup>2</sup>USDA-ARS, Pacific Basin Research Center, Hilo, HI.
- 9:00**      **41**      Efficacy of Commercially Available Baits for House Fly (*Musca domestica*) Control on Southern California Dairies. **Sarah M. Butler**, Bradley A. Mullens and Alec Gerry. University of California, Department of Entomology, Riverside, CA.
- 9:12**      **42**      Population Reduction of Alfalfa Loopers with Kairomone Based Killing Stations, and Sugar Influence on Attraction Rates. **Leonardo De A. Camelo**<sup>1</sup>, Peter J. Landolt<sup>2</sup>, and Richard S. Zack<sup>1</sup>. <sup>1</sup>Washington State University, Department of Entomology, Pullman, WA, <sup>2</sup>USDA-ARS, Yakima Agricultural Research Laboratory, Wapato, WA.
- 9:24**      **43**      Effect of Irrigation Deficit on the Population Dynamics of *Homalodisca coagulata* (Hemiptera: Cicadellidae). **Rodrigo Krugner**<sup>1</sup>, Russell L. Groves<sup>2</sup>, James R. Hagler<sup>3</sup>, Robert F. Luck<sup>1</sup>, and Marshall W. Johnson<sup>1</sup>. <sup>1</sup>University of California, Department of Entomology, Riverside, CA, <sup>2</sup>USDA-ARS San Joaquin Valley Agricultural Sciences Center, Parleir, CA, <sup>3</sup>USDA-ARS Western Cotton Research Laboratory, Phoenix, AZ.
- 9:36**      **44**      Evaluation of Sampling for Thrips and a Survey of Economically Important Insects in California Timothy. **Dominic D. Reisig**<sup>1</sup>, Larry D. Godfrey<sup>1</sup> and Daniel B. Marcum<sup>2</sup>. <sup>1</sup>University of California, Department of Entomology, Davis, CA, <sup>2</sup>University of California, Cooperative Extension, McArthur, CA.
- 9:48**      **45**      Relative Flight Performance of *Rhagoletis indifferens* (Diptera: Tephritidae): Influence of Crowding, Set and Resources. **Susan E. Senger**<sup>1</sup>, Bernard D. Roitberg<sup>1</sup>, Howard Thistlewood<sup>2</sup>. <sup>1</sup>Simon Fraser University, Department of Biology, Burnaby, BC, Canada, <sup>2</sup>Pacific Agri-Food Research Centre, Summerland, BC, Canada.
- 10:12**      **46**      Effects of Perchlorate and Chromium (VI) on the Survival, Development, and Microbial Control of Larval Mosquitoes. **Mary A. Sorensen**, William E. Walton, and John T. Trumble. University of California, Department of Entomology, Riverside, CA.

- 10:24**      **47**      Efficacy of four devices for sampling wetland macroinvertebrates. **Jennifer Henke**<sup>1</sup> and D. Batzer<sup>2</sup>. <sup>1</sup>University of California, Department of Entomology, Riverside, CA, <sup>2</sup>University of Georgia, Department of Entomology, Athens, GA.

**Symposium: Structural Pests: Research and Education**

*Room – Haku*  
*8:00 A.M. - Noon*

Organizers: **Carrie Foss** and **Art Antonelli**  
Washington State University, Puyallup, WA

Moderator: **Art Antonelli**

- 8:00**      **48**      Potential for Horizontal Transfer of Insecticides Among Termites. **Michael K. Rust**, Raj Saran, and Donald A. Reiersen. University of California Riverside, Department of Entomology, Riverside, CA.
- 8:30**      **49**      Update on Residential Perimeter Treatment Trials in Hawaii with Thiamethoxam, Termidor and Premise. **Julian R. Yates III**. University of Hawaii at Manoa, Department of Plant and Environmental Protection Sciences, CTAHR, Honolulu, HI.
- 9:00**      **50**      Factors Affecting Control and Subsequent Evaluations of the Western Subterranean Termite, *Reticulitermes hesperus* Banks. **Donald A. Reiersen**, M.K. Rust, A.C. Briones, and R.K. Saran. University of California, Department of Entomology, Riverside, CA.
- 9:30**      **51**      Efficacy of Recruit IV Termite Bait Against Subterranean Termites in Arizona, California, and Hawaii. **Mike Lees**. Dow Agrosciences, Granite Bay, CA
- 10:00**      Break
- 10:20**      **52**      Deathwatch Beetles – Educating an Industry. **Daniel A. Suomi**. Washington State Department of Agriculture, Olympia, WA.
- 10:50**      **53**      Ant Research and Training. **Laurel D. Hansen**. Spokane Falls Community College, Biology Department, Spokane, WA.
- 11:20**      **54**      Novel Approaches for Training Structural Pest Inspectors and Pest

Managers. **Carrie R. Foss** and Arthur L. Antonelli. Washington State University, Department of Entomology, Puyallup, WA.

**Symposium: Attract and Kill Technologies for  
Fruit Fly Management**

*Room – Pikake*

*8:00 A.M. - Noon*

Organizers and Moderators: **Diane Alston**<sup>1</sup> and **Ron Mau**<sup>2</sup>

<sup>1</sup>Utah State University, Logan, UT, <sup>2</sup>University of Hawaii, Honolulu, HI

- 8:00** Introduction, **Diane Alston and Ron Mau**
- 8:05**      **55**      Recent Research and Development of Attract and Kill Devices for Area-Wide Suppression of Tephritid Fruit Flies in Hawaii. **Roger I. Vargas**<sup>1</sup>, Ronald F.L. Mau<sup>2</sup>, and Eric B. Jang<sup>1</sup>. <sup>1</sup>USDA-ARS, Pacific Basin Agricultural Research Center, Hilo, HI, <sup>2</sup>University of Hawaii, Department of Plant and Environmental Protection Sciences, Honolulu, HI.
- 8:25**      **56**      Effect of Bait Sprays in Wiliwili Borders of Papaya Fields on Melon Fly and Oriental Fruit Fly (Diptera: Tephritidae) Populations. **Grant T. McQuate**. USDA-ARS, Pacific Basin Agricultural Research Center, Hilo, HI.
- 8:45**      **57**      Impact of GF-120 Spinosad Bait for Melon Fly Control in Cucurbit and Melon Crops. **Ronald F.L. Mau**<sup>1</sup>, Roger I. Vargas<sup>2</sup>, Raju Pandey<sup>1</sup>, and Ming-Yi Chou<sup>1</sup>. <sup>1</sup> University of Hawaii at Manoa, Hawaii Area-Wide Fruit Fly Pest Management Program, Honolulu, HI, <sup>2</sup>USDA-ARS, Pacific Basin Agricultural Research Center, Hilo, HI.
- 9:05**      **58**      Protein Bait Sprays and Their Effects on Attraction, Feeding Responses, and Control of Fruit Flies in Washington State. **Wee L. Yee**. USDA, Yakima Agricultural Research Laboratory, Wapato, WA.
- 9:25**      **59**      Behavioral Responses of *Rhagoletis* Fruit Flies to Insecticide Bait Sprays. **Larry Gut**, Kirsten Pelz, Rufus Isaacs, Luis Teixeira and Lukasz Stelinski. Michigan State University, Department of Entomology, East Lansing, MI.
- 9:45**      **60**      Factors that Influence the Efficacy of Spinosad-Based Control of Olive Fruit Fly and Walnut Husk Fly. **Robert A. Van Steenwyk**. University of California, Department of E.S.P.M., Berkeley, CA.

- 10:05** Break
- 10:25**      **61** Retention and Mortality of Western Cherry Fruit Fly in Response to GF-120 and Bait Concentration. **Diane G. Alston**<sup>1</sup>, and Thor Lindstrom<sup>2</sup>. <sup>1</sup>Utah State University, Department of Biology, Logan, UT, <sup>2</sup>Utah Agricultural Experiment Station, Kaysville, UT.
- 10:45**      **62** Implementation of GF-120 into Western Cherry Fruit Fly (*Rhagoletis indifferens* Curran) Control Programs in the Pacific Northwest USA. **Timothy J. Smith** and Esteban Gutierrez. Washington State University Extension, Wenatchee, WA.
- 11:05**      **63** Methyl Eugenol and Spinosad: Hawaiian Fruit Fly Research Used in Mainland Eradication Programs. **Robert V. Dowell**. California Department of Food and Agriculture, Sacramento, CA.
- 11:25**      **64** Novel Approaches to Attract and Kill Systems for Area-Wide Suppression of Fruit Flies. **Eric B. Jang**. USDA-ARS, Pacific Basin Agricultural Research Center, Hilo, HI.
- 11:45-Noon** Discussion

**AWARDS LUNCHEON**

*Lokelani Ballroom*  
*Noon-1.30 P.M.*

**Symposium: Aphids, Aphid-Parasitoids, and Aphid-Ant Associations  
On Islands in the Pacific Ocean**

*Room – Haku*  
*1:30 – 3:30 P.M.*

Organizer and Moderator: **Keith Pike**  
Washington State University, Prosser, WA

- 1:30** Introduction
- 1:35**      **65** Aphids of Micronesia. **Ross H. Miller**<sup>1</sup>, Olivia Idechiil, Keith S. Pike<sup>2</sup> and Robert G. Footitt<sup>3</sup>. <sup>1</sup>University of Guam, College of Agriculture & Life Sciences, Mangilao, Guam, <sup>2</sup>Washington State University, Prosser, WA, <sup>3</sup>Agriculture & Agri-Food Canada, Ontario K1A 0C6 Canada.
- 1:55**      **66** Aphids of Hawaii: Traits Promoting Invasive Success. **Edward B.**

**Mondor**, Michelle N. Tremblay, and Russell H. Messing. Kaua'i Agricultural Research Center, Kapa'a, HI.

- 2:15**            **67**    Molecular Genetic Diversity in *Aphis gossypii*. **Robert G. Footitt**<sup>1</sup>, Ross H. Miller<sup>2</sup>, and K.S. Pike<sup>3</sup>. <sup>1</sup>Agriculture and Agri-Food Canada, Central Experiment Farm, Ontario K1A 0C6 Canada, <sup>2</sup>University of Guam, College of Agriculture and Life Sciences, Mangilao, Guam, <sup>3</sup>Washington State University, Irrigated Agriculture Research and Extension Center, Prosser, WA.
- 2:35**            **68**    Aphid-Parasitoids of Guam. **Keith S. Pike**<sup>1</sup>, Ross H. Miller<sup>2</sup>, and P. Stary<sup>3</sup>. <sup>1</sup>Washington State University, Prosser, WA, <sup>2</sup>University of Guam, College of Agriculture & Life Sciences, Mangilao, Guam, <sup>3</sup>Institute of Entomology, Academy of Sciences of the Czech Republic, Branisovska, Czech Republic.
- 2:55**            **69**    Ants Associated with Aphids of Guam. **Laurel D. Hansen**. Spokane Falls Community College, Biology Department, Spokane, WA.
- 3:15-3:30**            Discussion

**Symposium: First Response Strategies and Tactics for Arthropod Invasions:  
Past and Future**

*Room – Pikake*

*1:30 – 5:30 P.M.*

Organizers and Moderators: **Marshall W. Johnson**<sup>1</sup> and **Lynn M. LeBeck**<sup>2</sup>

<sup>1</sup>University of California, Riverside, CA,

<sup>2</sup>University of California, Berkeley, CA

- 1:30**            Introduction, **Marshall Johnson**
- 1:35**            **70**    Combating the Olive Fly on New Ground. **Marshall W. Johnson**. University of California, Department of Entomology, Riverside, CA.
- 2:00**            **71**    First New World Report of the Q Biotype of *Bemisia tabaci* (Gennadius) Reveals High Levels of Resistance to Insecticides. **Timothy J. Dennehy**<sup>1</sup>, Judith K. Brown<sup>2</sup>, and Frank Byrne<sup>3</sup>. University of Arizona, Departments of <sup>1</sup>Entomology and <sup>2</sup>Plant Sciences, Tucson, AZ, <sup>3</sup>University of California, Department of Entomology, Riverside, CA.





CA, <sup>2</sup>California Department of Food and Agriculture, Biological Control Program, Sacramento, CA, <sup>3</sup>University of Florida Tropical Research and Education Center, Homestead, FL.

**5:10-5:30** Discussion, **Lynn LeBeck** (coordinator)

### Contributed Papers

*Room - Maile*

*1:30 – 5:30*

Moderators, **Christelle Guedot**<sup>1</sup>, **Raymond Yokomi**<sup>2</sup>

<sup>1</sup>USDA-ARS, Wapato, WA, <sup>2</sup>USDA-ARS, Parlier, CA

*Section F*

- 1:30**        **78**        Influence of Late-Season Insects on the Development of Sticky Cotton in California Cotton. **Larry D. Godfrey**<sup>1</sup> and Treanna Pierce<sup>2</sup>. <sup>1</sup>University of California, Department of Entomology, Davis, CA, <sup>2</sup>University of California, Shafter Cotton Research and Extension Center, Shafter, CA.
- 1:42**        **79**        Spinosad and Methoxyfenozide for Managing Lepidopteran Pests in Low-Desert Lettuce and Cole Crops. **Jesse M. Richardson**<sup>1</sup>, John C. Palumbo<sup>2</sup>, Eric T. Natwick<sup>3</sup>, and Mark B. Hertlein<sup>4</sup>. <sup>1</sup>Dow AgroSciences, Hesperia, CA, <sup>2</sup>University of Arizona, Yuma, AZ, <sup>3</sup>UC Cooperative Extension, Holtville, CA, <sup>4</sup>Dow AgroSciences, Indianapolis, IN.
- 1:54**        **80**        Biological Control of the European Cherry Fruit Fly with Entomopathogenic Nematodes and its Practicability. **Heidrun Vogt**<sup>1</sup>, Annette Herz<sup>1</sup>, Kirsten Koppler<sup>1,4</sup>, Peter Katz<sup>2</sup> and Arne Peters<sup>3</sup>. <sup>1</sup>Federal Biological Research Centre for Agriculture and Forestry, Institute for Plant Protection in Fruit Crops, Dossenheim, Germany, <sup>2</sup> Katz Biotech AG, Baruth, <sup>3</sup>e-Nema GmbH, Ralsdorf. <sup>4</sup>University of Heidelberg, Department of Zoology, Heidelberg, Germany.
- 2:06**        **81**        Progress in Establishing Biocontrols of Cereal Leaf Beetle (*Oulema Melanopus*) in Washington State. **Diane E. Roberts**<sup>1</sup>, Terry D. Miller<sup>2</sup>, Keith S. Pike<sup>3</sup>, and Steven M. Miller<sup>4</sup>. <sup>1</sup>Washington State University Extension, Spokane, WA, <sup>2</sup>Washington State University, Department of Entomology, Pullman, WA, <sup>3</sup>Washington State University, Department of Entomology, Prosser, WA, <sup>4</sup>USDA-APHIS, Spokane, WA.

- 2:18**      **82**      Plant Productivity and the Efficacy of Pear Psylla (*Cacopsylla pyricola*) Biocontrol. **Matthew P. Daugherty** and Cheryl J. Briggs. Department of Integrative Biology, University of California, Berkeley, CA.
- 2:30**      **83**      Bait Sprays - An Alternative to Control the European Cherry Fruit Fly *Rhagoletis cerasi*. **Kirsten Koppler**<sup>1,2</sup>, Volker Storch<sup>2</sup>, and Heidrun Vogt<sup>1</sup>. <sup>1</sup>Federal Biological Research Centre for Agriculture and Forestry, Institute for Plant Protection in Fruit Crops, Dossenheim, Germany, <sup>2</sup>University of Heidelberg, Department of Zoology, Heidelberg, Germany.
- 2:42**      **84**      Screening Soybean Breeding Lines for Stink Bug and Velvetbean Caterpillar Resistance. **Robert M. McPherson**<sup>1</sup>, Phillip M. Roberts<sup>1</sup> and Glenn R. Buss<sup>2</sup>. <sup>1</sup>University of Georgia, Department of Entomology, Coastal Plain Experiment Station, Tifton, GA, <sup>2</sup>Virginia Tech University, Department of Crop and Soil Environment Sciences, Blacksburg, VA.
- 2:54**      **85**      Advances Towards IPM of a New Mealybug Pest, *Ferrisia gilli*, in California Pistachios. **David R. Haviland**. UC Cooperative Extension, Bakersfield, CA.
- 3:06**      Break
- 3:30**      **86**      Potential for Augmentative Control of *Helocoverpa zea* in Seed Corn Using *Trichogramma achaeae*. **Mark G. Wright**<sup>1</sup> and Michael Rupert<sup>2</sup>. <sup>1</sup>University of Hawaii at Manoa, Department of Plant & Environmental Sciences, Honolulu, HI., <sup>2</sup>Pioneer Hi-Bred, Oahu, HI.
- 3:42**      **87**      Implementing Biological Control of Oriental Fruit Moth in California Peaches. **Walt Bentley** and Susan Mallek. University of California, Kearney Agricultural Center, Parlier, CA.
- 3:54**      **88**      Tenlined June Beetle: Major Challenge; Little Success. **Marshall W. Johnson**. University of California, Department of Entomology, Riverside, CA.
- 4:06**      **89**      Metaflumizone: Trial Results with a New Semicarbazone Insecticide in Row Crops and Vegetables. **Philip H. Munger**, Albert C. Everson, Larry J. Newsom, and Thomas J. Holt. BASF Corporation, Research Triangle Park, North Carolina.
- 4:18**      **90**      Stress Effects on Feeding of the Formosan Subterranean Termite,

*Coptotermes formosanus* Shiraki (Isoptera: Rhinotermitidae). **R. Joseph Woodrow** and J. Kenneth Grace. University of Hawaii at Manoa, Department of Plant and Environmental Protection Sciences, Honolulu, HI.

- 4:30**            **91**    A Landscape Level Approach to Managing the Western Spotted Cucumber Beetle in Vegetable Cropping Systems. **John M. Luna**, Adam R. Poole, and Windy C. Beck. Oregon State University, Department of Horticulture, Corvallis, OR.
- 4:42**            Adjourn

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Wednesday, March 8

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**Final Business Meeting**

*Room – Pikake*  
7:30 – 8:00 AM

**Symposium: Recent Advances in the Biological and Chemical  
Control of Arthropods in Floriculture**

*Room - Pikake*  
8A.M. - Noon

Organizers and Moderators: **Michael Parrella<sup>1</sup>** and **Arnold Hara<sup>2</sup>**

<sup>1</sup>University of California , College of Agriculture and Environmental Sciences, Davis CA

<sup>2</sup>University of Hawai‘i at Manoa, College of Tropical Agriculture & Human Resources,  
Hilo, HI

- 8:00** Introduction, Michael Parrella
- 8:10**      **92**      Trials and Tibulations of Biological Control Implementation in Oregon Greenhouses and Nurseries. **Robin Rosetta**, Oregon State University, North Willamette Research and Extension Center, Aurora, OR
- 8:30**      **93**      Foreign Exploration for Natural Enemies of the Stinging Nettle Caterpillar, *Darna pallivitta* Moore, a New Pest in Hawai‘i. **Walter T. Nagamine**, Hawai‘i Department of Agriculture, Plant Pest Control Branch, Honolulu, HI.
- 8:50**      **94**      Updates on the Rearing biology of *Quadrastichus erythrinae* Kim – a Critical Step in Quarantine Evaluation of the Natural Enemies of the *Erythrina* gall wasp. **Juliana A. Yalem**, Hawai‘i Department of Agriculture, Plant Pest Control Branch, Honolulu, HI.
- 9:10**      **95**      Chemical Control of *Quadrastichus erythrinae* Infesting *Erythrina* spp. in Hawaii’s Diverse Environmental Conditions. **Christopher M. Jacobsen**, University of Hawaii at Manoa, CTAHR, Beaumont Agricultural Research Center, Hilo, HI.
- 9:30**      **96**      Development and Implementation of an IPM Program for *Gerbera*

Grown as Cut Flowers. **Michael P. Parrella**, University of California, CAES, Department of Entomology, Davis, CA.

- 9:50** Break
- 10:05** **97** The Role of Silicon in Reducing Leafminer Attack in Chrysanthemums. **Thomas P. Costamagna**, University of California, Department of Entomology, Davis, CA.
- 10:25** **98** Use of Essential Oils for Pest Control in Floriculture. **Ramon Georgis**, EcoSMART Technologies, Inc., Franklin, TN.
- 10:45** **99** Citrus Peel Extract Cuts the Wax of Scales and Mealybugs. **Rob Hollingsworth**, Pacific Basin Agricultural Research Center, USDA-ARS, Hilo, HI.
- 11:05** **100** Reduced-Risk Insecticides Against Tropical Floricultural Pests in Hawai'i. **Arnold H. Hara**, University of Hawaii at Manoa, CTAHR, Beaumont Agricultural Research Center, Hilo, HI.
- 11:25-Noon** Discussion

### Contributed Papers

Room - Maile

8:00 – 11:30 A.M.

Moderators: **Mark Sisterson**<sup>1</sup>, **Silvia Rondon**<sup>2</sup>

<sup>1</sup>USDA-ARS, Parlier, CA, <sup>2</sup>Oregon State University, Hermiston, OR

### Section C

- 8:00** **101** A Survey for *Spiroplasma citri*, A Leafhopper-Transmitted Pathogen of Citrus and Other Crops in Central California. **R.K. Yokomi**<sup>1</sup>, A. Mello<sup>2</sup>, C. Kallsen<sup>3</sup>, J. Nunez<sup>3</sup>, J. Gorden<sup>4</sup>, N. O'Connell<sup>5</sup>, M. Freeman<sup>6</sup>, J.C. Chen<sup>1</sup>, and J. Fletcher<sup>2</sup>. <sup>1</sup>USDA-ARS, Parlier, CA, <sup>2</sup>Oklahoma State University, Department of Entomology & Plant Pathology, Stillwater, OK, <sup>3</sup>University of California, Coop. Extension Kern County, Bakersfield, CA, <sup>4</sup>Pest Management Associates, Inc., Exeter, CA, <sup>5</sup>University of California, Coop. Extension Tulare County, Tulare, CA, <sup>6</sup>University of California, Cooperative Extension, Fresno, CA.
- 8:12** **102** What Can Insect Trap Catches Tell You? **Chang-chi Chu**, Matthew Ciomperlik, Eric T. Natwick, Tian-Ye Chen, and Thomas J. Henneberry. USDA-ARS, Western Cotton Research

Laboratory, Phoenix, AZ, USDA/APHIS/PPQ/CPHST/PDDM, Edinberg, TX, University of California, Coop. Extension, Holtville, CA.

- 8:24**      **103**      Poison-Baiting for Control of the Western Yellowjacket Wasp in Hawaii. **David Foote**<sup>1</sup>, Cause Hanna<sup>2</sup>, Cynthia King<sup>2</sup>, and Eric Spurr<sup>3</sup>. <sup>1</sup>U.S. Geological Survey, Pacific Island Ecosystem Research Center, Hawaii National Park, HI, <sup>2</sup>Pacific Cooperative Studies Unit, University of Hawaii at Manoa, Honolulu, HI. <sup>3</sup>Landcare Research, Inc., Lincoln, New Zealand.
- 8:36**      **104**      Host Range of *Secusio extensa* (Lepidoptera: Arctiidae) and Potential for Biological Control of *Senecio madagascariensis*. **Mohsen M. Ramadan**, Ken T. Murai, and Tracy Johnson. Hawaii Department of Agriculture, Plant Pest Control Branch, Honolulu, HI, Institute of Pacific Islands Forestry, Pacific Southwest Research Station, USDA Forest Service, Volcano, HI.
- 8:48**      **105**      Flies are Efficient Pollinators of *Allium ampeloprasum*. **Steve L. Clement**, Barbara C. Hellier, and Leslie R. Elbersen. USDA-ARS, Washington State University, Pullman, WA.
- 9:00**      **106**      Assessing the Non-Target Impacts of Introduced Parasitoids on Hawaiian Leafroller Moths (Crambidae: *Omiodes*). **Cynthia B.A. King** and Daniel Rubinoff, University of Hawaii, Department of Plant and Environmental Protection Sciences, Honolulu, HI.
- 9:12**      **107**      Reproductive Biology of *Fopius ceratitivorus* (Hymenoptera: Braconidae): a Potential Parasitoid for Fruit Flies Biological Control. **Aime H. Bokonon-Ganta**<sup>1</sup>, Mohsen M. Ramadan<sup>2</sup>, Xin-Geng Wang<sup>1</sup>, and Russell H. Messing<sup>1</sup>. <sup>1</sup>College of Tropical Agriculture and Human Resources, Department of Plant and Environmental Protection Sciences, Honolulu, HI, <sup>2</sup>State of Hawaii Department of Agriculture, Division of Plant Industry, Plant Pest Control Branch, Honolulu, HI.
- 9:24**      **108**      Studies of *Fopius arisanus* and *Psytalia fletcheri* Parasitoids on *Bactrocera cucurbitae* (Coq.) (Diptera:Tephritidae) in North Shore Oahu, HI. **Ernest J. Harris**<sup>1</sup>, Renato C. Bautista<sup>2</sup>, Roger I. Vargas<sup>3</sup>, and Eric B. Jang<sup>3</sup>. <sup>1</sup>U.S. Pacific Basin Agricultural Research Center, USDA-ARS, Honolulu, HI, <sup>2</sup>Plant Pest Control Branch, Plant Industry Division, Hawaii Department of Agriculture, Honolulu, HI, <sup>3</sup>USDA-ARS, Pacific Basin Agricultural Research Center, Hilo, HI.
- 9:36**      **109**      Ecology & Management of Cherry Fruit Flies (*Rhagoletis* spp.) at

the Ag-Rural Interface in British Columbia. **Howard Thistlewood**. Pacific Agri-Food Research Centre, Agriculture and Agri-Food Canada, Summerland, B.C., Canada.

**9:48**            **110**    Interactions Between an Exotic Pathogen and Native Beetles Induce Resistance in Native Monterey Pines. **N. Erbilgin**<sup>1</sup>, D.L. Wood<sup>1</sup>, T.R. Gordon<sup>2</sup>, and A.J. Storer<sup>3</sup>. <sup>1</sup>University of California, Division of Insect Biology, Berkeley, CA, <sup>2</sup>University of California, Department of Plant Pathology, Davis, CA, <sup>3</sup>School of Forest Reserve and Environmental Science, Michigan Technological University, Houghton, Michigan.

**10:00**            **111**    Pollution Effects on Insect Populations. **John T. Trumble**. University of California, Department of Entomology, Riverside, CA.

**10:12**            Break

#### Section A

**10:32**            **112**    Grasshopper Outbreak on a small NW Hawaiian Island: A Threat to Biodiversity? **Alexandre Latchininsky**, University of Wyoming, Laramie, WY.

**10:44**            **113**    Unreported Chironomid Diversity in Hawaii and Implications for Ecological Monitoring. **Karl Magnacca**<sup>1</sup>, David Foote<sup>2</sup>, and Patrick O'Grady<sup>3</sup>. <sup>1</sup>Pacific Cooperative Studies Unit, University of Hawaii at Manoa, Honolulu, HI, <sup>2</sup>USGS Pacific Island Ecosystems Research Center, Hawaii National Park, HI, <sup>3</sup>University of California-Berkeley, Department of Environmental Science, Policy and Management, Berkeley, CA.

#### Section B

**10:56**            **114**    Diet Quality and Nutrient Intake Moderate the Influence of Nicotine on the Facultative Specialist *Manduca sexta*. **S.N. Thompson** and R.A. Redak. University of California, Department of Entomology, Riverside, CA.

**11:08**            **115**    Effects of Selected Acaricides on the Predator *Galendromus occidentalis* (Acari, Phytoseiidae). **Francisco J. Saenz-de-Cabezón** and Frank G. Zalom. University of California, Department of Entomology, Davis, CA.



Section E

- 11:20**            **116**    Integrating Pest Management Practices in Eastern Oregon to Control the Invasive Potato Tuber Moth. **Sandra DeBano**<sup>1</sup>, George Clough<sup>2</sup>, Phil B. Hamm<sup>3</sup>, Andrew Jensen<sup>4</sup>, Silvia I. Rondon<sup>5</sup>. <sup>1</sup>Oregon State University, Hermiston Agricultural Research and Education Center, Department of Fisheries and Wildlife, <sup>2</sup>Oregon State University, Hermiston Agricultural Research and Education Center, Department of Horticulture, <sup>3</sup>Oregon State University, Hermiston Agricultural Research and Education Center, Department of Plant Pathology, <sup>4</sup>Washington State Potato Commission, <sup>5</sup>Oregon State University, Hermiston Agricultural Research and Education Center, Department of Crop and Soil Sciences.
- 11:32**            **117**    Adoption of Area-Wide Fruit Fly (Diptera:Tephritidae) Management Program in Hawaii. **Ming-Yi Chou**<sup>1</sup>, Ronald F.L. Mau<sup>1</sup>, Roger I. Vargas<sup>2</sup>, and Raju R. Pandey<sup>1</sup>. <sup>1</sup>University of Hawaii at Manoa, Department of Plant and Environmental Protection Sciences, Honolulu, HI, <sup>2</sup>USDA-ARS Pacific Basin Agricultural Research Center, Hilo, HI.

## End of the 90<sup>th</sup> ESA Pacific Branch Meeting

### MEETING NOTES

The 90th annual meeting of the Pacific Branch of the Entomological Society of America will begin with on-site registration on Sunday, March 5 and end at noon on Wednesday, March 8. The scientific program will feature eight symposia, submitted papers and posters, a graduate student symposium, and student paper and poster competitions. Enjoy a Monday night mixer followed by the Linnaean Games. An Awards Luncheon will be held on Tuesday at noon.

#### **PROGRAMS:**

Printed programs will be available at the meeting and electronically at <http://pbsa.prosser.wsu.edu> after February 15, 2006.

#### **ABSTRACTS:**

Abstracts will be available after February 15, 2006 at <http://pbsa.prosser.wsu.edu>. Feel free to download and print abstracts at your convenience because paper copies will not be available at the meeting.

#### **POWERPOINT SLIDESHOW PRESENTATIONS:**

The presentation format will be PowerPoint files viewed with laptop computers and projectors. We will be supplying laptop computers and LCDs. Organizers of symposia are responsible for collecting talks and loading files onto computer for their session. Contributed papers will be loaded on computer at meeting site. Please bring file on CD or USB memory stick and check for posting regarding time and place for computer loading. The meeting Operations Committee will assist with preparation of A/V equipment at each session during the meeting. Please contact Mark Wright at [markwrig@hawaii.edu](mailto:markwrig@hawaii.edu) for questions about meeting rooms and A/V operations.

#### **POSTER DISPLAY PRESENTATIONS:**

Student poster displays will be presented in the Jade Room on Monday, March 6 from 11:00 A.M. to 5:45 P.M. The general poster session will be presented in the Jade Room on Monday, March 6, from 11:00 A.M. to 5:00 P.M. and on Tuesday, March 7, from 9:00 A.M. to 5:00 P.M. The Jade Room will be available for authors to set up their displays in advance on both days from 8:00-9:00 A.M. Displays should be taken down by 6:00 P.M. on the day of the presentation. Posters should not exceed 4 ft. x 4 ft. in size. Authors need to bring their own pushpins. **Authors are expected to be present at their posters from 11:00 A.M. - 12:00 Noon and from 1:00-2:00 P.M. on the day of their presentation.**

#### **MODERATORS:**

Session moderators are responsible for keeping speakers on schedule. If a presentation is completed early, or cancelled, the moderator must ensure that the next presentation begins at the scheduled time.

## **MEETING INFORMATION AND SCHEDULE CHANGES:**

Notices, meeting schedule changes and general information will be posted throughout the meeting at the Registration Desk. Information on points of interest, dining, and entertainment will be available at the registration desk.

## **REGISTRATION:**

Pavilion Lanai

Sunday, March 5        2:00-7:00 P.M.

Monday, March 6       7:00 A.M. – 5:00 P.M.

Tuesday, March 1      7:00 A.M. – 12 Noon

Everyone attending the Pacific Branch meeting must register. Registration will be located at the Pavilion Lanai. Those who are pre-registered may pick up registration materials there. On-site registration is \$150.00 for members, \$180.00 for non-members, and \$50.00 for students, emeritus, honorary, and guests. Credit cards cannot be accepted.

## **EXECUTIVE COMMITTEE:**

The Pacific Branch Executive Committee will meet Sunday evening, March 5, from 5:00-7:00 P.M. in the Puakenikeni Room.

## **BUSINESS MEETINGS:**

The preliminary business meeting will be held at the end of the opening session at 10:45 A.M. on Monday, March 6 in the Pikake Room. The final business meeting will be held from 7:30-8:00 A.M. on Wednesday, March 8 in the Maui Room. Plan to attend to vote for officers and other important Pacific Branch business.

## **GRADUATE STUDENT PAPER/POSTER COMPETITIONS:**

Competitions include oral paper presentations and poster displays. Senior authors must be student members of the Pacific Branch and be registered for the meeting. First and second place prizes will be awarded at the Awards Luncheon for the best 10-minute oral presentations and posters in two categories, one for Masters and one for Ph.D. candidates. Judging will be based on scientific merit, organization, clarity, and format. Please contact Carol Anelli at sheppc@mail.wsu.edu for questions about this contest.

## **AWARDS:**

Recipients of the prestigious C.W. Woodworth Award; John Henry Comstock Graduate Student Award; ESA National Recognition Awards; and graduate student paper and poster contest awards will be presented at the Awards Luncheon Tuesday, March 7, Lokelani Ballroom, 12 Noon – 1:30 P.M.

## **MIXER, PRESIDENT'S RECEPTION, AND AWARDS LUNCHEON:**

A Pacific Branch Mixer and President's Reception will be held Monday, March 6, 5:00 – 7:00 P.M. in the Pacific Terrace with light fare and cash bar. Entry to the mixer is included in the registration fee and access to the mixer is by ticket only. There is a fee of \$20.00 for the mixer for non-registered guests with tickets available at the registration

desk. The Awards Luncheon is scheduled for Tuesday noon and a ticket is included in the registration fee for those who register by noon on Monday. Access to the Awards Luncheon is by ticket only. Non-registered guest lunch tickets will be available for \$30.00 if purchased at the registration desk before noon on Monday.

**LINNAEAN GAMES:**

The Games will be held on Monday, March 6 from 7:00-9:00 P.M. in the Maile Room. The winning Pacific Branch team will be eligible to compete in the 2006 National ESA Linnaean Games in Indianapolis, IN. Contact Sue Blodgett at [blodgett@montana.edu](mailto:blodgett@montana.edu) for more information.

**DIRECTIONS BY AUTO:**

**AIRPORTS AND GROUND TRANSPORTATION:** Direct flights are available from the mainland to the Maui airport in Kahului. Driving directions from the Kahului airport to the Wailua Resort - Exit Kahului Airport and turn left onto Highway 380. Follow signs Kihei/ Wailea. Turn left onto Highway 350, continue onto Mokulele Highway 380. Turn left onto Piilani Highway 31, continue for approximately 7 miles to Wailea Ike Drive and turn right. Continue to traffic signal and turn right onto Wailea Alanui. Continue to second left turn lane and turn into our resort driveway. Bus service, fee: 30 USD (one way). Estimated taxi fare: 35 USD (one way).

**WEATHER:**

In March the temperature in Maui ranges from a high of 83°F (28°C) to a low of 64°F (18°C). The ocean water temperature averages about 74°F (23°C).

**LOCAL ATTRACTIONS:**

Maui is an extremely beautiful place. The Haleakala Crater is a favorite destination. Lahaina is an old Whaling town that now is a major shopping destination. The road to Hana and a visit to Hana Town is an adventure with beautiful scenery. The Iao Valley is the site of one of the most famous battles in ancient Hawaiian history. In 1790 King Kamehameha I destroyed the Maui army in an effort to unite the Hawaiian Islands. The Maui Ocean Center is rated as Hawaii's top family attraction. Aquarium details can be obtained at: <http://www.mauioceancenter.com/home.html>. Tour a working tropical farm at Maui Tropical Plantation - <http://www.mautropicalplantation.com/>. There are over 20 golf courses in Maui including three courses in Wailea, the Gold, Emerald and Blue courses. Helicopter tours of the island give tourist a spectacular view. There is wonderful snorkeling around the island and whale watching tours are available. Hiking, horseback riding, sunset cruises, and a host of other activities are also available.

**ASSISTANCE:**

If you need help please contact John Stark, 2006 ESA Pacific Branch President at [starkj@wsu.edu](mailto:starkj@wsu.edu) or visit the Pacific Branch website at <http://pbsa.prosser.wsu.edu>. A list of all volunteer Pacific Branch Committee Members with contact information is also available on the website.

## PACIFIC BRANCH OFFICER NOMINATION



The Pacific Branch Nominations committee composed of Keith Pike, Frank Zalom and Ross Miller, recommends Dr. Larry Godfrey for President-Elect of the Pacific Branch. Dr. Godfrey is an Extension Entomologist and Entomologist in the Agricultural Experiment Station in the Dept. of Entomology at the Univ. of California-Davis. His research focuses on development and refinement of IPM programs in field and vegetable crops as well as delivery of information to clientele. His research interests include developing improved sampling and decision guidelines for major arthropod pests of California crops including cotton, rice, alfalfa, cool-season grasses and dry beans, insect-plant interactions, applied ecological studies, and development of non-chemical management methods. Dr. Godfrey received his B.S and M.S degrees from Purdue Univ. and his Ph.D. from the Univ. of Kentucky with all three degrees in Entomology. Before joining the UC faculty in 1991, he held positions with the Univ. of Nebraska and Union Carbide Agricultural Products.

His honors and professional activities include Finalist for the UC-Davis Academic Federation Excellence in Research Award, Award for Excellence in Integrated Pest Management from the Pacific Branch in 2005, and chairing the Cooperative Regional Project S-300 “Mosquito and Agricultural Pest Management in Riceland Ecosystems”. Dr. Godfrey serves on numerous industry panels and research advisory committees. He is an Associate Technical Editor for the Journal of Cotton Science and serves on the International Editorial Board for Crop Protection.

Dr. Godfrey has served the Pacific Branch on the Executive Committee and Auditing and Registration committees and the national ESA as Chair of Section F, Program Committee, student competition judge, Editorial Board for Journal of Medical Entomology, and Local Arrangements Co-Chair for the 2004 Annual Meeting in Salt Lake City.

### *AWARDS*

The C. W. Woodworth and John Henry Comstock Awards will be presented during the opening session on Monday, February 28. All other awards will be presented during the awards luncheon on Tuesday, March 1.

### ***C. W. WOODWORTH AWARD***

**The C. W. Woodworth Award annually recognizes a person in the Pacific Branch of the Entomological Society of America who has made outstanding contributions to entomology during the past decade. The 2005 Woodworth Award goes to Dr. Jocelyn Millar of the Department of Entomology, University of California, Riverside, CA.**



**The following is the Abstract for Dr. Millar's presentation at the Opening Session.**

#### **DECIPHERING INSECT COMMUNICATION SYSTEMS: A LONG AND WINDING ROAD**

**Jocelyn G. Millar**

**Department of Entomology, University of California, Riverside CA 92521**

Humans normally think of communication in terms of sound or vision, such as speech and writing. However, for many organisms, exchange of chemical signals constitutes their primary method of communication, and chemical signaling was probably the first type of communication to evolve. For these microbes, plants, and animals, individual chemicals might be viewed as our equivalent of letters or words, that can be combined in various ways to create many different messages. Thus, in the same way that we use an alphabet of 26 letters to make thousands of words, a large number of different chemical signals can be generated by blending a small number of chemicals together in different combinations.

Chemical signals and cues mediate many aspects of insect behavior and life history, including reproduction, feeding and oviposition, and defense. Our research has been focused primarily on the identification, synthesis, and development of practical applications of insect pheromones and related chemicals that mediate insect behaviors. To give an idea of how ubiquitous this type of communication is within the Insecta, in my group alone we have worked on chemical signaling in insects as diverse as moths,

flies, mosquitoes, beetles, true bugs, scales, mealybugs, ants, termites, bees, and parasitic wasps. Along the way, our research has gone in some unexpected directions when it has become clear that the organisms under study were using more than one medium for communication, for example, by combining chemical signals with visual or acoustic signals. Other projects have stopped and restarted several times, as new ideas suggested possibilities for further research. Illustrative examples have been taken from three projects.

As a first example, we began identifying pheromones for a series of true bugs in the late 1990's, and that work is still continuing. The pheromones of some species (e.g., mirid bugs in the genus *Phytocoris*) were straightforward, both in their chemistry and how they worked. However, the pheromones of phytophagous stink bugs were more complicated, and at first, it appeared that they did not work very well at all (although they did attract bug parasites and predators!). However, more careful observation revealed that these bugs were actually using two overlapping sets of signals. That is, pheromones were used to get males and females onto the same plant, but once on the plant, the bugs used substrate-borne vibrational signals to locate each other, and for courtship and recognition once they were in contact. In fact, each species and sex produced its own unique repertoire of 3-5 different types of vibrational signals, for use in different contexts. Overall, use of these vibrational signals appears to be an efficient method of mate location, while simultaneously limiting eavesdropping by predators and parasitoids.

The second example had its genesis in a collaborative project on invasive cerambycid beetles that started in 1989 with Drs. Tim Paine, Larry Hanks, and myself. We wanted to learn about the biology and ecology of *Phoracantha punctata*, and later *Phoracantha recurva*, two serious pests of Eucalyptus that had been introduced into California from Australia. We have studied many aspects of the life history and biological control of these beetles, but one of the offshoots from this project was that we became increasingly interested in cerambycid beetles overall, and particularly, their use of chemical signals. This has now blossomed into a longterm, multiparticipant project, from which we hope to develop an overall outline of pheromone occurrence and use in this large insect family, including how the pheromones are used, the types of chemicals that are involved, and how the chemicals are mixed and matched in subsets by different species to generate unique chemical signals.

The third project, on the sex pheromone of navel orangeworm, a major pest of nut crops in California, also began in 1989 but for years we made little progress. In the last couple of years, using a surrogate species as a model we were finally able to prove that there were missing components to the pheromone blend. Now, looking back over data from many years, it is clear that those trace components were there all along, but were missed because they were not where or what we expected them to be. This project served as a salutary lesson in the value of conducting research with an open mind, rather than expecting results to fall into known or predicted patterns.

***JOHN HENRY COMSTOCK AWARD***



This year's winner of the Comstock Award for the Pacific Branch of the ESA is **Jeremy D. Allison**, who supplied this brief biographical sketch. After completion of my undergraduate degree in biology (University of Guelph, 1997) I entered the Master of Pest Management (MPM) program at Simon Fraser University and worked with Dr. J.H. Borden. The research component of my degree examined semiochemical-based interactions between bark and woodboring beetles with the aim of developing a commercially, operational bait. In the fall of 2001 I began study for a Ph.D. in entomology at the University of California, Riverside, with Dr. R.T. Cardé. My dissertation research focuses on the genetic basis of variation in the sex pheromone of the stored products pest *Cadra cautella* (Lepidoptera: Pyralidae) and the consequences of the variation within and among generations. The results of my research will document how directional selection can modify sex pheromones, suggest the consequences, type and strength of selection acting on variation in sex pheromones, and explore the potential for the evolution of resistance to pheromone-based mating disruption as well as providing information for mitigating potential risks.

**ENTOMOLOGICAL SOCIETY OF AMERICA  
PACIFIC BRANCH COMMITTEES  
2005-2006**

**Program:** Todd Shelly

**Registration:** Rob Hollingsworth

**Local Arrangements:** Don McInnis

**Operations Committee:** Mark Wright

**Awards Canvassing:** Carolyn Pickel

**Awards Selection Committee:** Anonymous members

**C. W. Woodworth Award Sponsor:** Brian Holden

**Nominations Committee:** Keith S. Pike (Chair), Frank Zalom, Ross Miller

**Membership:** Frank Zalom

**Graduate Student Symposium:** Jennifer Henke

**Linnaean Games:** Sue Blodgett

**Student Paper and Poster Contest:** Carol Anelli

**ESA Committee on Student Affairs, Pacific Branch Representative:**

Hannah J. Burrack (2004-2006)

**Student Liaison:** Darcy Oishi

**Exhibitor Arrangements:** Brian Bret



**Employment Opportunities:** Patrick Weddle

**Auditing:** Tad Gantenbein

**Resolutions:** James D. Barbour

**Plaques:** Kurt Volker

**Pacific Branch Website:** David Allison

**Site Selection Committee:** Lucia Varela (Chair)

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Alvarez, J.	POSTER	P31	Tue	Jade
Armstrong, J.	SYMP	6	Mon 2:42	Haku
Banks, J.	SYMP	21	Mon 1:05	Pikake
Bentley, W.	PAPER	87	Tue 3:42	Maile
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Golden, M.	POSTER	P21	Mon	Jade
Grafton-Cardwell, E.	SYMP	77	Tue 4:45	Pikake
Greenfield, B.	POSTER	P40	Tue	Jade
Groves, R.	SYMP	75	Tue 3:55	Pikake
Guedot, C.	SYMP	14	Mon 2:05	Maile
Gut, L.	SYMP	59	Tue 9:25	Pikake
Hagen, J.	SYMP	25	Mon 2:25	Pikake
Hagler, J.	POSTER	P22	Mon	Jade
Haines, W.	SC-PHD	30	Mon 4:08	Pikake
Hansen, L.	SYMP	53	Tue 10:50	Haku
Hansen, L.	SYMP	69	Tue 2:55	Haku
Hara, A.	SYMP	4	Mon 2:02	Haku
Hara, A.	SYMP	100	Wed 11:05	Pikake
Harris, E.	PAPER	108	Wed 9:24	Maile
Haviland, D.	PAPER	85	Tue 2:54	Maile
Henke, J.	SC-PHD	47	Tue. 10:24	Maile
Higbee, B.	POSTER	P41	Tue	Jade
Hogg, B.	DSC-PD	P12	Mon	Jade
Hollingsworth, R.	SYMP	99	Wed 10:45	Pikake
Jacobsen, C.	SYMP	95	Wed 9:10	Pikake

James, D.	SYMP	18	Mon 3:40	Maile
Jang, E.	SYMP	15	Mon 2:25	Maile
Jang, E.	SYMP	64	Tue 11:25	Pikake
Jensen, P.	SC-PHD	32	Mon 4:32	Pikake
Johnson, M.	SYMP	70	Tue 1:35	Pikake
Johnson, M.	PAPER	88	Tue 3:54	Maile
Johnson, R.	POSTER	P23	Mon	Jade
Kapranas, A.	SC-PHD	31	Mon 4:20	Pikake
Kaufman, L.	DSC-PD	P13	Mon	Jade
King, C.	PAPER	106	Wed 9:00	Maile
Kirschenbaum, R.	DSC-MS	P4	Mon	Jade
Kishimoto, C.	SC-MS	27	Mon 3:32	Pikake
Knight, A.	POSTER	P42	Tue	Jade
Knight, A.	POSTER	P43	Tue	Jade
Koppler, K.	PAPER	83	Tue 2:30	Maile
Krugner, R.	DSC-PD	P15	Mon	Jade
Krugner, R.	SC-PHD	43	Tue 9:24	Maile
Krushelnycky, P.	SC-PHD	39	Tue 8:36	Maile
Kund, G.	POSTER	P44	Tue	Jade
Latchininsky, A.	PAPER	112	Wed 10:32	Maile
Leblanc, L.	SC-PHD	40	Tue 8:48	Maile
Lees, M.	SYMP	51	Tue 9:30	Haku
Light, D.	POSTER	P45	Tue	Jade
Loope, L.	SYMP	2	Mon 1:22	Haku
Lozier, J.	SC-PHD	29	Mon 3:56	Pikake
Luna, J.	PAPER	91	Tue 4:30	Maile
Madsen, T.	POSTER	P46	Tue	Jade
Maghodia, A.	SC-PHD	36	Tue 8:00	Maile
Magnacca, K.	PAPER	113	Wed 10:44	Maile
Mau, R.	SYMP	57	Tue 8:45	Pikake
McPherson, R.	PAPER	84	Tue 2:42	Maile
McQuate, G.	SYMP	56	Tue 8:25	Pikake
Messing, R.	SYMP	76	Tue 4:20	Pikake
Millar, J.	AWARD		Mon 9:25	Maile
Millar, J.	SYMP	20	Mon 4:20	Maile
Miller, R.	SYMP	65	Tue 1:35	Haku
Miller, R.	POSTER	P24	Mon	Jade
Mondor, E.	SYMP	66	Tue 1:55	Haku
Munger, P.	PAPER	89	Tue 4:06	Maile

Nagamine, W.	SYMP	93	Wed 8:30	Pikake
Natwick, E.	POSTER	P47	Tue	Jade
Newman, J.	POSTER	P28	Tue	Jade
O'Neal, M.	DSC-MS	P5	Mon	Jade
Orloff, S.	POSTER	P48	Tue	Jade
Paine, T.D.	SYMP	73	Tue 2:50	Pikake
Palumbo, J.	POSTER	P29	Tue	Jade
Parrella, M.	SYMP	96	Wed 9:30	Pikake
Pease, C.	POSTER	P49	Tue	Jade
Pike, K.	SYMP	68	Tue 2:35	Haku
Prado, S.	DSC-PD	P14	Mon	Jade
Ramadan, M.	PAPER	104	Wed 8:36	Maile
Redak, R.	POSTER	P30	Tue	Jade
Reierson, D.	SYMP	50	Tue 9:00	Haku
Reisig, D.	SC-PHD	44	Tue 9:36	Maile
Richardson, J.	PAPER	79	Tue 1:42	Maile
Roberts, D.	PAPER	81	Tue 2:06	Maile
Robson, J.	SC-MS	28	Mon 3:44	Pikake
Rodstrom, A.	DSC-MS	P6	Mon	Jade
Rosetta, R.	SYMP	92	Wed 8:10	Pikake
Rust, M.	SYMP	48	Tue 8:00	Haku
Saenz-de-Cabezón, F.	PAPER	115	Wed 11:08	Maile
Scott, E.	DSC-MS	P8	Mon	Jade
Senger, S.	SC-PHD	45	Tue 9:48	Maile
Siderhurst, M.	SYMP	16	Mon 2:45	Maile
Sisterson, M.	POSTER	P25	Mon	Jade
Smith, T.	SYMP	62	Tue 10:45	Pikake
Snyder, A.	POSTER	P26	Mon	Jade
Snyder, W.	SYMP	23	Mon 1:45	Pikake
Sorensen, M.	SC-PHD	46	Tue 10:12	Maile
Srinivasan, R.	SC-PHD	35	Mon 5:08	Pikake
Straub, C.	SC-PHD	34	Mon 4:56	Pikake
Suomi, D.	SYMP	52	Tue 10:20	Haku
Szucs, M.	DSC-MS	P9	Mon	Jade
Thompson, P.	POSTER	P50	Tue	Jade
Thompson, S.	PAPER	114	Wed 10:56	Maile
Thistlewood, H.	PAPER	109	Wed 9:36	Maile
Toscano, N.	SYMP	74	Tue 3:30	Pikake
Tremblay, M.	POSTER	P51	Tue	Jade

Trumble, J.	PAPER	111	Wed 10:00	Maile
Van Steenwyk, R.	SYMP	60	Tue 9:45	Pikake
Vargas, R.	SYMP	9	Mon 3:57	Haku
Vargas, R.	SYMP	55	Tue 8:05	Pikake
Varon, E.	SYMP	24	Mon 2:05	Pikake
Vogt, H.	PAPER	80	Tue 1:54	Maile
Wilkinson, M.	SYMP	1	Mon 1:02	Haku
Winston, R.	DSC-MS	P7	Mon	Jade
Wong, L.	SYMP	3	Mon 1:42	Haku
Woodrow, R.	PAPER	90	Tue 4:18	Maile
Wright, M.	PAPER	86	Tue 3:30	Maile
Wright, S.	POSTER	P52	Tue	Jade
Yalemar, J.	SYMP	94	Wed 8:50	Pikake
Yates III, J.	SYMP	49	Tue 8:30	Haku
Yee, W.	SYMP	58	Tue 9:05	Pikake
Yokomi, R.	PAPER	101	Wed 8:00	Maile
Yokoyama, V.	SYMP	8	Mon 3:37	Haku
Zahn, D.	DSC-MS	P10	Mon	Jade

**Key to Presentation  
Types:**

PAPER	Contributed 10 minute Paper
SC-MS	Student Comp. Paper (M.S.)
SC-PD	Student Comp. Paper (Ph.D.)
POSTER	Submitted Poster Display
DSC-MS	Student Comp. Poster Display (M.S.)
DSC-PD	Student Comp. Poster Display (Ph.D.)
SYMP	Symposium Presentation
AWARD	Woodworth or Comstock Award Winner

## PROGRAM SUMMARY

Date	Time	Event	Room
<b>Sunday</b>			
<b>5-Mar</b>			
	Noon-5pm	Office	Plumeria
	Noon-5pm	Speaker Ready Room	Plumeria
	2-7pm	Registration	Pavilion Lanai
	5-7pm	Executive Committee Meeting	Puakenikeni
<b>Monday</b>			
<b>6-Mar</b>			
	7am-5pm	Office	Plumeria
	7am-5pm	Speaker Ready Room	Plumeria
	7am-5pm	Registration	Pavilion Lanai
	8-10:25am	Opening Session	Maile
	10:25-10:45am	Break	Pacific Terrace
	10:45-11:30am	Preliminary Business Meeting	Maile
	11am-5pm	Posters	Jade
	1-5pm	Symposium - Yokoyama	Haku
	1-5pm	Symposium - Camelo	Maile
	1-3:20pm	Symposium - Banks	Pikake
	3:30-5:30pm	Symposium - Student (I)	Pikake
	5-7pm	Mixer/President's Reception	Pacific Terrace
	7-10pm	Linnaean Games	Maile
<b>Tuesday</b>			
<b>7-Mar</b>			
	7am-5pm	Office	Plumeria
	7am-5pm	Speaker Ready Room	Awapuhi
	7am-Noon	Registration	Pavilion Lanai
	8-11am	Symposium - Student (II)	Maile
	8am-Noon	Symposium - Foss	Haku
	8am-Noon	Symposium - Alston	Pikake
	9am - 5pm	Posters	Jade
	Noon-1:30 pm	Awards Lunch	Lokelani Ballroom

	1:30-3:30pm	Symposium - Pike	Haku
	1:30-5:30pm	Symposium - Johnson	Pikake
	1:30-5:30pm	Contributed Papers (I)	Maile
<b>Wednesday</b>			
<b>8-Mar</b>	7am-Noon	Office	Plumeria
	7am-Noon	Speaker Ready Room	Plumeria
	8am-Noon	Symposium - Hara	Pikake
	8am-Noon	Contributed Papers (II)	Maile
	7:30-8am	Final Business Meeting	Pikake