



## Interactive Short Course *Focusing on Tomorrow Today*

Enhancing biological control in orchard cropping systems.

**February 7-8, 2012**

*concurrently at:*

**CTC in Wenatchee WA,  
ESD in Pasco, WA and  
The Pine Grove Grange in  
Hood River, OR**

***To register for this session visit:***

<http://enhancedbiocontrol.org>

**February 22-23, 2012**

**Robert J Cabral Agric.  
Center, Stockton, CA**

***To register for this session visit:***

<http://enhancedbiocontrol.org>

# Enhancing Biological Control in Western Orchards



USDA-NIFA SCRI grant #2008-04854

[enhancedbiocontrol.org](http://enhancedbiocontrol.org)

## Focusing on Tomorrow Today

- ✓ *Why does biological control matter? - What is the economic impact of biological control for the grower?*
- ✓ *Are pesticides and biological control compatible? - What effects do the newer insecticides have on key natural enemies?*
- ✓ *How do I know what's out there? - New lures and monitoring tools to determine natural enemy presence and importance.*
- ✓ *Can we predict natural enemy presence in orchards to reduce their exposure to pesticides?*
- ✓ *Which predators are most valuable in reducing codling moth?*

**These and more questions are the focus of a USDA Specialty Crops Research Initiative grant-funded project to enhance biological control in western apple, pear and walnut orchards.**

**We invite you to our interactive workshop to learn more about natural enemies and novel tools to maximize biological control in your operation.**

## 2-Day Interactive Short Course

### **Course highlights:**

- Discuss general principles of biological control in perennial crops with examples from apple, pear and walnut orchards.
- Engage in understanding and solving issues related to secondary pest outbreaks and the impact of invasive pests on IPM practices.
- Practice developing IPM programs and strategies that support biological control.
- Learn how to identify key natural enemies and pests they control.
- Discover new tools for monitoring natural enemies.
- Explore web resources and how they can help you to integrate biological control into your management strategy.
- Learn from new research the effects of pesticides on natural enemies.
- Understand the economic consequences of natural enemy removal in orchards.

**The information presented in this short course is helpful and relevant to most perennial cropping systems.**

Each day of the course is designed to give participants a broad understanding of the use of natural enemies through a mixture of presentations, small group hands-on sessions and open discussions. All material is presented by experts in the field and derived from their cutting edge research.

### Day 1 Outline

- Welcome and Overview of Course
- Introduction to Biological control (BC): types of BC; common orchard targets; success rates; historical examples and values of success; lessons learned and forgotten.
- Principles of pest-natural enemy (NE) interactions; new tools; benefits; NE requirements; BC in organic vs. conventional settings.

#### BREAK

- NE groups, life histories & pests controlled; identification exercise by crop hands-on practice.

**LUNCH** - in-house with open discussions

- All about monitoring NE populations
- NE phenology and modeling
- Small group exercise: windows of opportunity/ selectivity; use of online decision support (DAS)

#### BREAK

- Pesticide effects on NEs
- Pesticide effects in the field
- Case Study 1: secondary pest problems - why did they get out of control?

**SOCIAL HOUR** - with Day 1 posters and open discussions in a casual setting.

### Registration includes:

- Instructional materials
- Morning & afternoon snacks/beverages
- Lunch
- Social Hour Receptions
- Several opportunities to meet with experts 1-on-1

### Day 2 Outline

- Quick review of Day 1
- Synthesis of Pesticide Effects: disruptive index concept and consequences of NE recovery time.
- Strengths & weakness of CM virus, Bt, and nematode use.
- Using insectary reared NEs: release issues; quality control; shipping and suppliers.

#### BREAK

- Landscape effects: alternate hosts; importance of nectar sources, refugia and ground covers.
- Case Study 2: Designing a BC friendly IPM program.

**LUNCH** - in-house with open discussions

- BC resources on the Web: EnhancedBC project, PMTP, UCIPM, etc.
- Economics of BC: premises behind the models.
- Economics of BC: results of economic modeling.
- Case Study 3: Effects of invasives in BC and how to protect your management programs.

#### BREAK

- Case Study 4: getting back to IPM after 'nuking' you orchard
- Review and course summary
- Course evaluation

**SOCIAL HOUR** - with Day 2 posters and open discussions in a casual setting.

*Note: Provided food items and beverages for breaks, lunches and social hours will vary according to meeting locations; informal discussions with expert speakers is limited to those present at each site.*

## Meet the experts:



**Dr. Vincent Jones**      *email: [vpjones@wsu.edu](mailto:vpjones@wsu.edu)*

Washington State University, Dept. of Entomology, Tree Fruit Research and Extension Center, Wenatchee, WA  
Vince's program specializes in novel approaches to population ecology and behavior of tree fruit pests with a focus on strategies to enhance biological control through the development of phenology models for key NEs, development of attractants and improved monitoring.



**Dr. Jay Brunner**      *email: [jfb@wsu.edu](mailto:jfb@wsu.edu)*

Washington State University, Dept. of Entomology, Tree Fruit Research and Extension Center, Wenatchee, WA  
Jay's research focuses on tree fruit crop IPM with specialization in sampling methods and action thresholds, insect phenology and predictive modeling, evaluation of BC agents, and use of MD for management of Lepidoptera pest.



**Dr. Nick Mills**      *email: [nmills@berkeley.edu](mailto:nmills@berkeley.edu)*

University of California Berkeley, Dept. of ESPM  
Nick's research is focused on biological control of insect pests and the ecology of insect parasitism and predation. One of the aspects of his work is to discover new elements of natural enemy biology providing a direct linkage to the implementation of improved biological control and a reduced reliance on pesticide intervention in IPM.



**Dr. Thomas Unruh**      *email: [thomas.unruh@ars.usda.gov](mailto:thomas.unruh@ars.usda.gov)*

USDA-ARS, Wapato, WA  
Tom's research focuses on biological control with emphasis on enhancement of natural enemies in orchard IPM systems, predator release practices, efficacy of attractants, augmentative BC and habitat manipulations.



**Dr. Dave Horton**      *email: [david.horton@ars.usda.gov](mailto:david.horton@ars.usda.gov)*

USDA-ARS, Wapato, WA  
Dave's research emphasis is on biorational management of temperate fruit insect pests, enhancing BC in orchard IPM systems, optimization of insect attractants and evaluation of HIPVs used for NE monitoring.



**Dr. Peter Shearer**      *email: [peter.shearer@oregonstate.edu](mailto:peter.shearer@oregonstate.edu)*

Oregon State University, MCARC, Hood River, OR,  
Peter's research activities involve studies on the management of arthropod pests of pome and stone fruits by enhancing IPM strategies and tactics including chemical, cultural, and biological control. Current focus areas include: sublethal effects of new pesticides on natural enemies, insecticide resistance management and evaluating impact of pesticides on target and not-target arthropods.



**Mr. Steve Castagnoli** *email: [steve.castagnoli@oregonstate.edu](mailto:steve.castagnoli@oregonstate.edu)*  
Oregon State University, MCARC, Hood River, OR,  
Steve is the Extension Horticulturist for Hood River County providing area growers with the tools they need to maintain an industry that is both economically and environmentally sustainable. Steve's main focus is supporting the area tree fruit industry with relevant educational programs through implementation projects, workshops, field days, informational meetings, and newsletters.



**Dr. Karina Gallardo** *email: [karina\\_gallardo@wsu.edu](mailto:karina_gallardo@wsu.edu)*  
Washington State University, School of Economic Sciences, Tree Fruit Research and Extension Center, Wenatchee, WA  
Karina is an Agribusiness Extension Specialist working in the area of enhancing value-added opportunities for specialty crops with a focus on consumer demand analysis and economics of technological change.



**Dr. Tunyalee Martin** *email: [tlamartin@ucdavis.edu](mailto:tlamartin@ucdavis.edu)*  
UC IPM, University of California, Davis, CA  
Tunyalee is UC IPM's Content Development Supervisor responsible for managing the team that develops the IPM manuals, Pest Management Guidelines, and other web site content.



**Dr. Angela Gadino** *email: [angela.gadino@wsu.edu](mailto:angela.gadino@wsu.edu)*  
Washington State University, Dept. of Entomology, Tree Fruit Research and Extension Center, Wenatchee, WA  
Angela is the Project Coordinator for SCRI project: "Enhancing Western Orchard Biological Control" and performs research and outreach aimed at promoting the adoption of sustainable ecosystem-based pest management strategies.



**Dr. Ute Chambers** *email: [uchambers@wsu.edu](mailto:uchambers@wsu.edu)*  
Washington State University, Dept. of Entomology, Tree Fruit Research and Extension Center, Wenatchee, WA  
Ute is the Project Manager for the WSU Decision Aid System. Her research and outreach focuses on IPM strategies for orchard pests, insect phenology modeling and the impacts of microhabitat and thermoregulation behavior on insect development.



**Dr. Marshal Johnson** *email: [marshall.johnson@ucr.edu](mailto:marshall.johnson@ucr.edu)*  
University of California at Riverside, Dept. of Entomology, Kearney Agric. Center, Parlier, CA  
Marshal is an expert in biological control and is responsible for tree crop extension in the San Joaquin Valley. Recent research has focused on perennial tree crop pests with an emphasis on developing alternative pest management strategies minimizing pesticide use while providing growers practical and feasible control.



**Dr. Lynn LeBeck** *email: [exdir@anbp.org](mailto:exdir@anbp.org)*  
Association of Natural Biocontrol Producers (ANBP), Clovis, CA  
Lynn is the Executive Director for ANBP, a non-profit organization that serves the commercial biocontrol industry in North America. Quality control and the effective use of beneficial predators, parasitoids, and entomopathogenic nematodes, are among their highest priorities.

# 2011 BioControl Short Course

*Presented by:*

Washington State University  
USDA- ARS Wapato  
Oregon State University  
University of California, Berkeley  
UC Cooperative Extension and UC IPM

<http://enhancedbiocontrol.org>