# Development of Biologically-Based Strategies of Managing Insect Pests of Horticultural Crops

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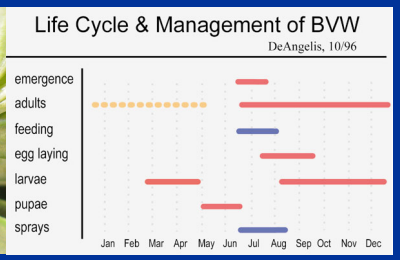
## The Problem

Black vine weevil, *Otiorhynchus sulcatus*

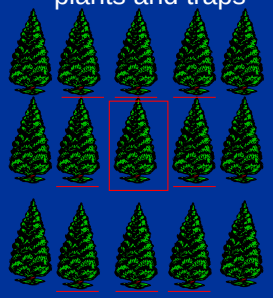
- Identified by nursery growers as the #1 insect pest
- Most widely occurring pest of ornamentals in the PNW
- Zero tolerance
- Adults are nocturnal making them difficult to monitor.




## Field Testing

Components formulated into 18 blends for field testing in Oregon

- 10 m between control and odor plots
  - 4 replicates at each nursery
- >20 m between odor treatments
  - 3-4 odors tested weekly at each location (refreshed weekly)
- Field tests performed in 2008 and 2009
- Determined the number of adults in "source" plant, neighboring plants and traps

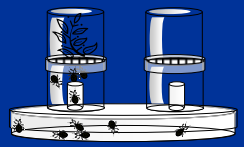


Source plant in center with neighboring plants. All plants indicated were searched for weevils weekly.

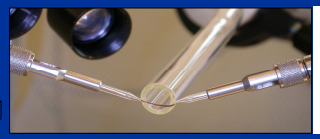
- Infested *Taxus* nursery (top left)
- Placing the odor in the canopy (top right).
- Shaking the canopy to remove weevils (lower left).
- Checking a trap for weevils (lower right).

## Attractant Identification

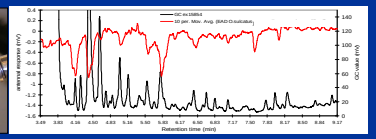
- Olfactometer used to identify attractive plants
- Electroantennogram (EAG) and GC-MS used to identify detectable compounds
- Blends of attractive compounds formulated in The Netherlands



Olfactometer used to identify attractive plants



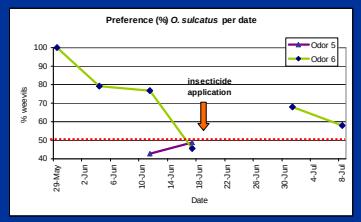
EAG

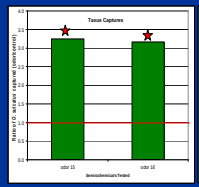


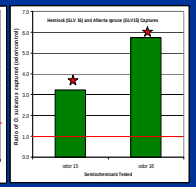
EAG recording overlayed with GC-MS peaks

## Results

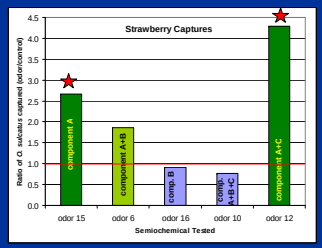
- A number of compounds were found to be attractive in the field.
- Significantly increased numbers of adults in odor vs control plots.
- Preovipositional adults (3-4 weeks after emergence) were most attracted to odors
- May be a host plant interaction that impacts attractiveness of the various compounds




*O. sulcatus* captures in ornamentals




*O. sulcatus* captures in strawberry

Acknowledgements
Northwest Center for Nursery Crop Research
Plant Research International, the Netherlands
Nursery Cooperators