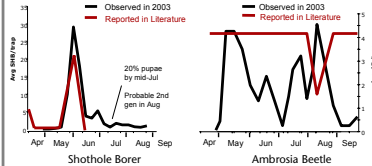
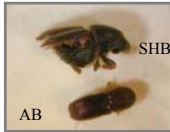


# Biology and Management of Bark Beetles in Stone and Pome Fruits

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## Species ID and Life History

- Dominant species in most orchards was Shothole Borer (SHB), *Scolytus rugulosus*
- Ambrosia beetle (AB), *Xyleborus dispar* or *X. saxexeni*, dominant at one location only
- Most locations had both species



Some observations in 2003 inconsistent with reported literature

## One generation lasts about 2 months



## Life Cycle

## Problem Areas and Damage



SHB reproduce in wood piles, burn piles, pushed out orchards and weakened or abandoned orchards



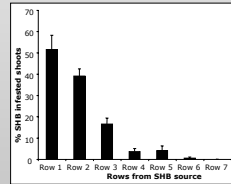
SHB most successful in greenwood, <1 yr old



Powderpost beetles, as well as others, attack older, dryer wood



SHB feeding on healthy trees is closely associated with source (See graph). Feeding can weaken and eventually kill tree.



## Insecticide Screening

Insecticide	1 DAT	7 DAT	21 DAT
Asana	100.0	86.1	77.8
Malathion	100.0	72.2	
Guthion	91.7	44.4	44.4
Thiodan	83.3	16.7	55.6
Actara	91.7	44.4	
Success	75.0	30.6	11.1
Avaunt	66.7	2.8	33.3
Assail	50.0	30.6	22.2
Carzol	58.3	16.7	
Sevin	41.7	2.8	

- Contact OPs, pyrethroids and organochlorines active against SHB
- New insecticides requiring ingestion moderately toxic, but residual control limited
- More study needed to understand potential for many insecticides



- Developed method for screening insecticides
- Requires large numbers of beetles
- Wood treated in lab, or sprayed in orchard.
- Collect at regular intervals and expose SHB adults

Maintain healthy trees. Sap flow flushes adult beetles out and prevents oviposition.



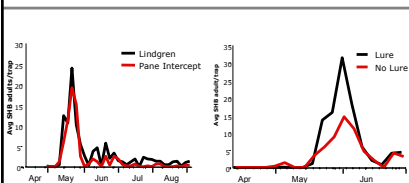
Good sanitation. Get rid of cut wood before May. Stressed wood attracts beetles and is ideal host for reproduction.



## Pesticide Management

- Reduce populations from late May through June, usually done while spraying other pests:
  - Leafrollers: Success; Aphid/mites/stink bugs- Thiodan; Scale-Diazinon; Cherry fruit fly- Malathion, Guthion, Sevin, Success, Diazinon
- Prevent damage in August and September:
  - Thiodan, Guthion

## Best Chances for Control

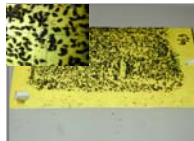


No difference between commercially available trapping systems. Traps did not catch large numbers of beetles.

Ethanol lure increased captures about 50%. Lure seems to be limiting factor in trapping system.



Trapping with Pane Intercept (PFM Technologies) or Lindgren Funnel (Phero Tech, Inc.) traps should be aimed at intercepting beetles leaving a source.



Yellow, or passive, sticky traps can predict infestations

## Monitoring Systems