

# Pests of Avocado



*Forficula auricularia*



*Serica alternata*

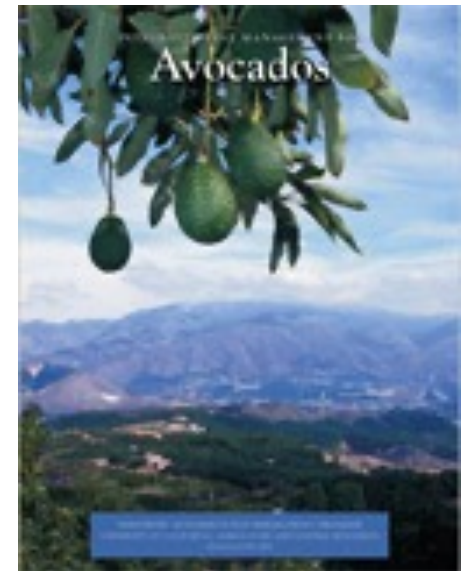


*Nysius raphanus*



*Pantomorus cervinus*

Generalists



# Avocado Specific



*Hemiberlesia lataniae*



*Heliethrips haemorrhoidalis*



*Pseudococcus longispinus*



- *Argyrotaenia citrana*



*Coccus hesperidum*



*Tetraleaurodes perseae*



*Oligonychus punicae*

Nearly all the specific pests that exist on California avocados were introduced from Mexico  
Probably on vegetative material (grafts)  
Don't import plants that you are not sure of their provenance.



# *Bio and Abiotic Stresses*



heat



asphyxiation

Lace bug, Botryosphaeria, salt



frost



verticillium



# Poll Question 1

The tree canopy collapses suddenly, the most likely cause is...

- a. Asphyxiation
- b. Phytophthora
- c. Avocado Lace Bug
- d. Snails
- e. Botryosphaeria



Lacewing larvae



Six spotted thrips

## Biological Control



Franklinothrips



Minute Pirate Bug



Black Hunter thrips



Hoverfly larvae

# Caterpillars – omnivorous looper, orange tortrix, amorbia

- Caterpillars are development stage of butterflies and moths
- Healthy mature trees with dense leaf canopy can sustain some degree of leaf damage and loss
- The situation may become desperate in case of young trees with small canopy or when really large number of caterpillars is present.
- Some caterpillar species may also damage young fruits, degrading their quality



Photo credits: David Rosen, UC Riverside

# Caterpillars – biological control

- A naturally occurring viruses often kills many caterpillars when their numbers become high.
- Certain caterpillar pathogens are commercially available as a selective insecticides:
  - *Bacillus thuringiensis* (Bt)
  - Fungus *Beauveria bassiana*
- Caterpillars can be also attacked by parasitic wasps and Tachinid flies that can keep numbers of some caterpillars below economically damaging levels. They lay their eggs on or in host eggs or caterpillars



Photo credit: Jack Kelly Clark, UC IPM



Photo credit: Merle Shepard, Gerald R. Carner, and P.A.C Ooi, Bugwood





# Caterpillars – cultural control

- Prune to reduce foliage touching among adjacent trees and to minimize dead twig and plant debris accumulation in canopies.
- Thin or selectively harvest fruit in clusters.
- Pruning and thinning reduce protected sites and canopy bridges that facilitate insect movement between trees, thereby reducing the abundance of caterpillars, greenhouse thrips, and mealybugs.
- Control weeds near avocado that host these caterpillars.
- Reduce dust in groves by driving slowly and watering dirt roads. Dusty conditions reduce the effectiveness of parasites and predators that attack caterpillars and other pests including mites and scales.
- MOTHS IN AUSTRALIA HAVE BEEN SHOWN TO BE AVOCADO POLLINATORS

# Mealybugs

- Nymphs and adult female mealybugs are soft, oval, white powder- or wax-covered insects.
- Adult males are tiny, two-winged insects with two long tail filaments, but are rarely seen.
- There are many different species, and it is important to identify which specie(s) is/are present in your orchard
- Mealybugs suck phloem sap.
- When in large numbers, they can reduce tree vigor, foul plants with sticky honeydew, and promote growth of blackish sooty mold that fouls fruit.



Photo credit: Jack Kelly Clark, UC IPM

# Mealybugs - management

- In California, pesticide application is not recommended for mealybugs in avocado. It is usually sufficient to conserve natural enemies that control most mealybug populations.
- Control sugar-feeding ants. Ants protect mealybugs from natural enemies (honeydew is an ant food source) so eliminating ants allows natural enemies to attack.
- Reduce dust, which also interferes with natural enemies.
- Whenever possible, apply only selective or short-residual pesticides when treating other pests.

## Biological control

- mealybug predators include green lacewing larvae, predaceous fly larvae, and lady beetles.
- Parasitic wasps are also important in controlling mealybug outbreaks



Photo credit: Jack Kelly Clark, UC IPM

# Mealybugs - pesticides

- It is critical to use pesticides that are effective for controlling identified specie(s) of caterpillars
- Always follow the pesticide label and laws
- Following are active ingredients for consideration:

## Spirotetramat

- Has broad range of activity - (mites, thrips, leafminers, aphids, armored scales); Natural enemies: predatory mites



Latania scale

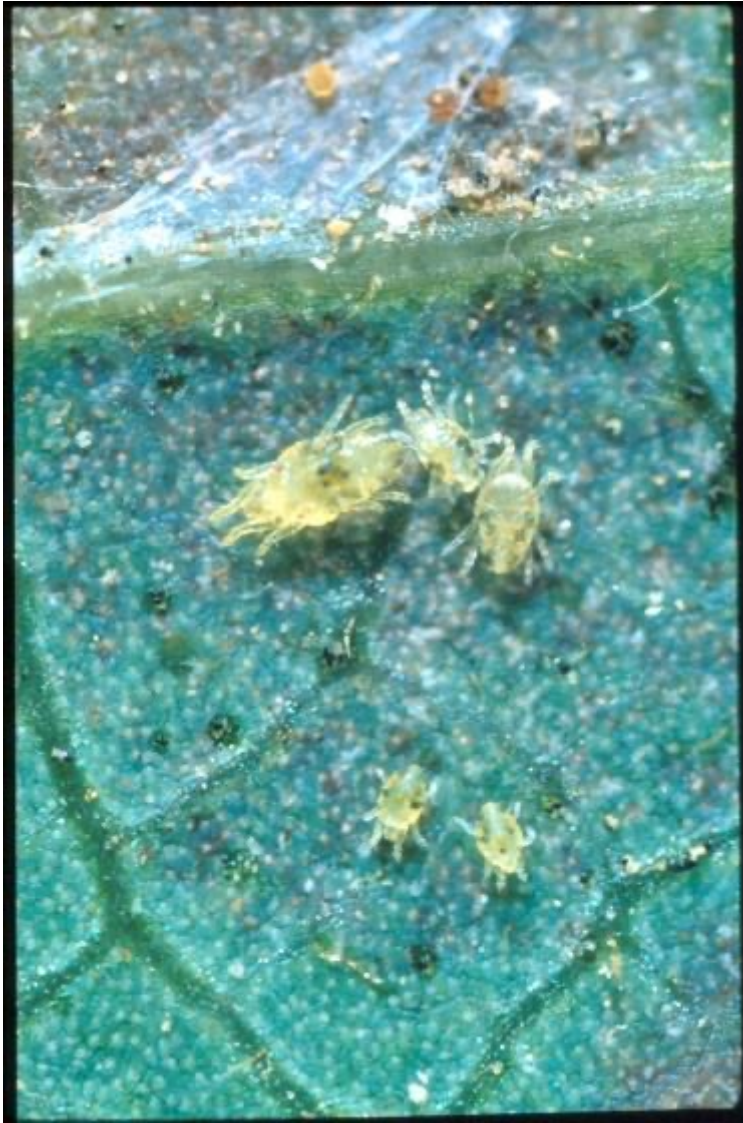


CA Red Scale



***Ceroplastes rusci***  
***Fig Wax Scale, recently introduced***

Scales under biological control  
but.....

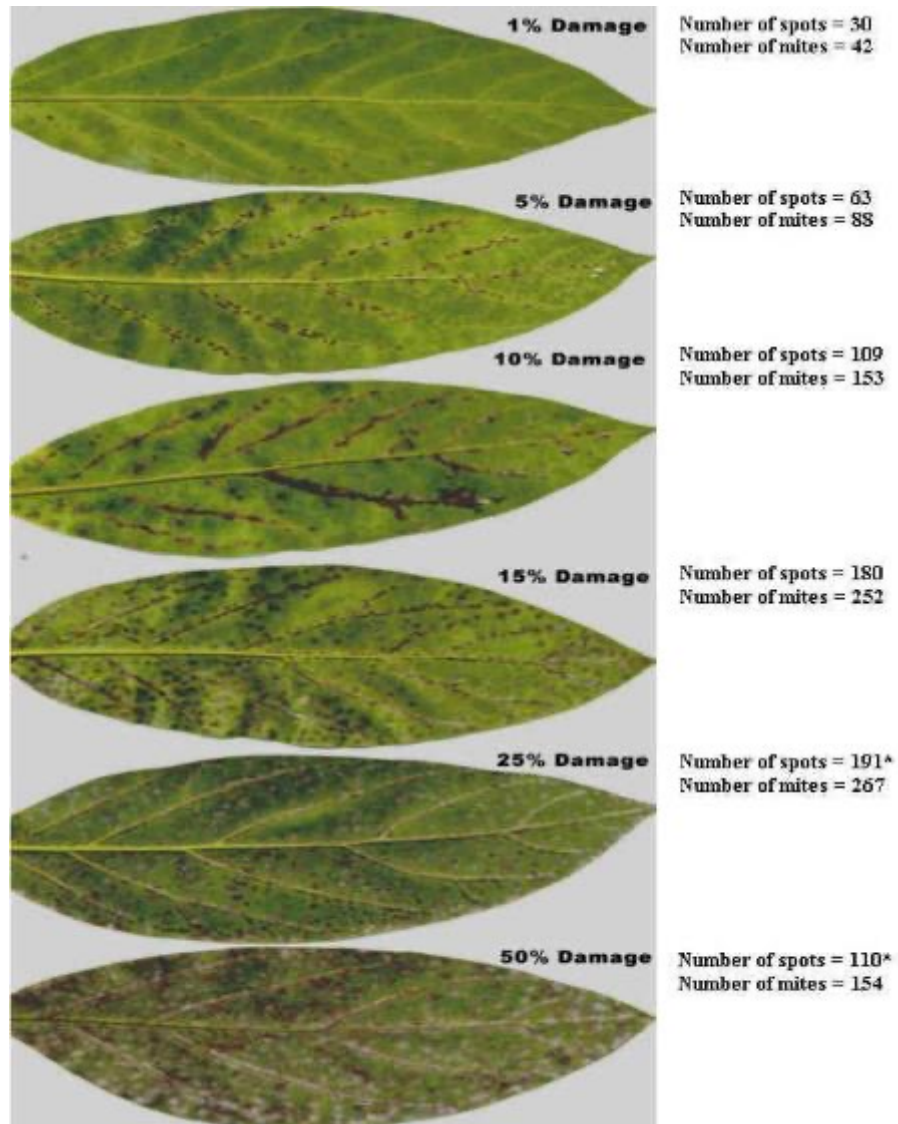


## **Persea Mite**

*Oligonychus perseae*

Begins building  
numbers in spring  
causing defoliation  
in fall

Early on, defoliated trees



# Controls

biological – Galendromus and Neoseiulus mites,

Chrysoperla spp

chemical – abamectin, spiroticlofen, oil

need to rotate because of resistance

water – works on small trees





## Poll Question 2

What is the major problem using sulfur along the coast?

- a. it's too cold to get a fuming action
- b. it doesn't work on avocados
- c. the trees are too big for it to work

# Identifying avocado thrips



## **Avocado thrips**

Fine abdominal bands  
Wings extend beyond abdomen  
Fast moving



## **Western Flower thrips**

Stout hairs on abdomen  
Shorter wings  
Slow moving



## **Citrus thrips**

No abdominal bands



## **Greenhouse thrips**

Adults black  
Immatures yellow, carry feces  
Slow moving



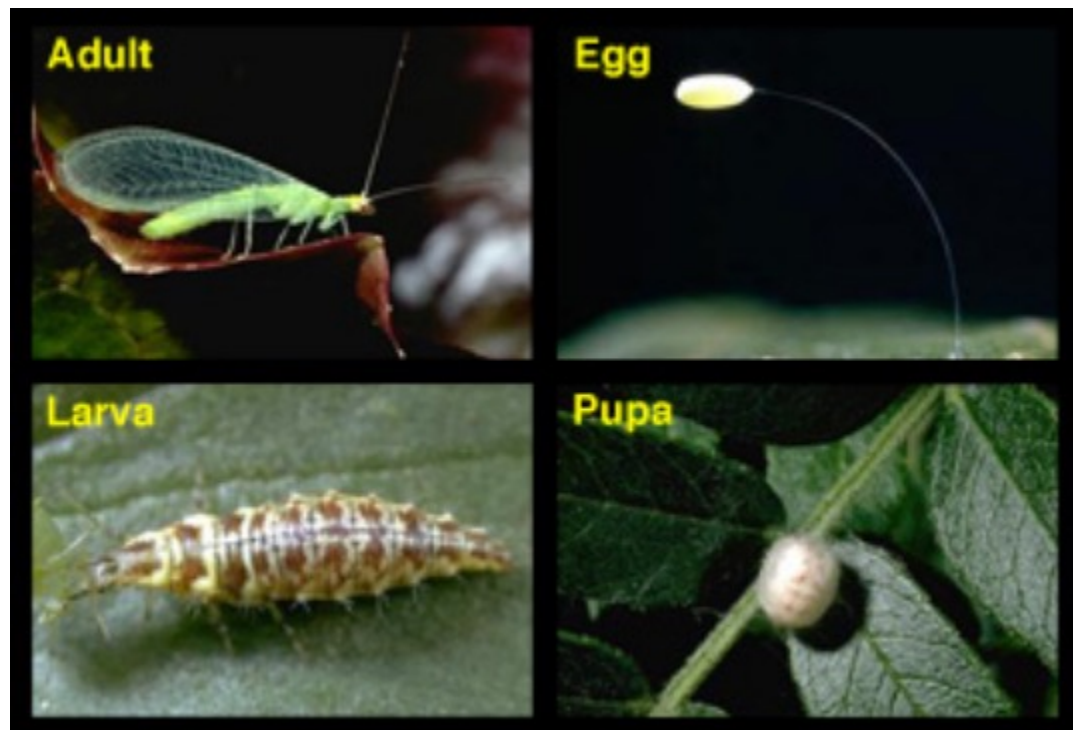
# Avocado Thrips

## *Scirtothrips perseae*

Feeds off new tissue  
very young fruit

Early on, defoliated trees





## Controls

biological – *Chrysoperla* spp.

chemical - spirotetramat, abamectin, spinetoram

Both perseas mite and avocado thrips are leaf pests and were probably introduced with illegal plant imports – human introduced

# Previous New Pests of California Avocado

All new to science when found

Generally takes 3-5 years for biological control  
to kick in

When spraying,  
only spray affected  
trees

Not whole orchard



Red-banded whitefly

1982



Persea mite

1990



Avocado Thrips

1996

# Recent New Pest Discoveries in Avocado



Diaprepes root weevil



Avocado Lace Bug



Leaf miner/roller



Neohydatothrips

# Avocado Lace Bug



*Pseudacysta  
perseae*

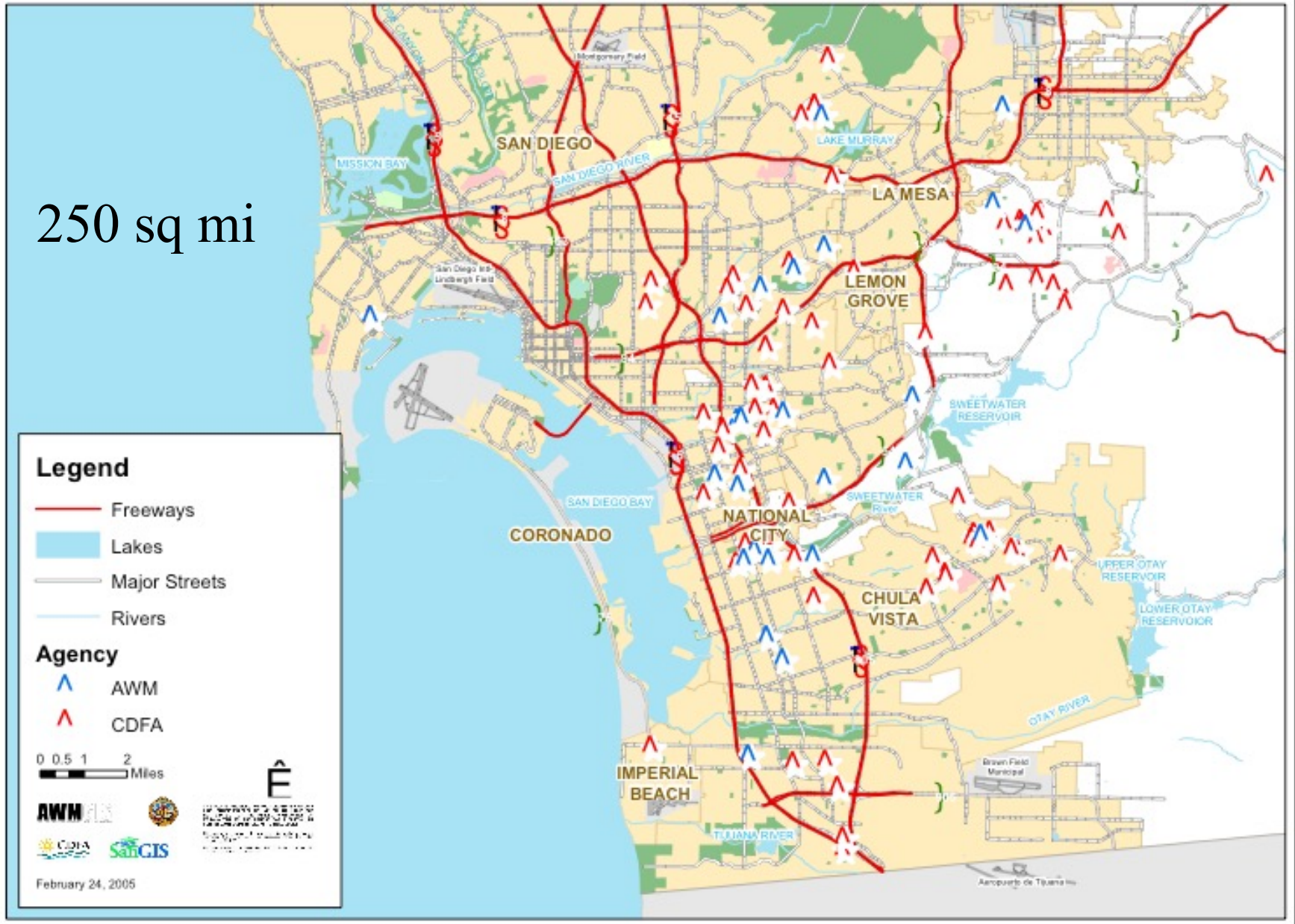






AVOCADO LACE BUG  
SAN DIEGO COUNTY  
2004 / 2005

250 sq mi



It was confined to the south, but now has popped up in several spots, like Carpinteria.  
Don't move bins with leaves!@!!!!

Controls

biological – Chrysoperla spp.

chemical – oil, imidicloprid, pyrethrin

A photograph of an avocado tree with numerous green, unripe avocados hanging from the branches. The leaves are dark green and glossy. The background is a clear blue sky.

***Neohydatothrips burungae***



**A thrips species previously unknown to California has been identified on backyard avocado trees in San Diego California.**

**The new thrips, *Neohydatothrips burungae*, was discovered by Dr. Mark Hoddle during a trip to inspect the lace bug infestation.**



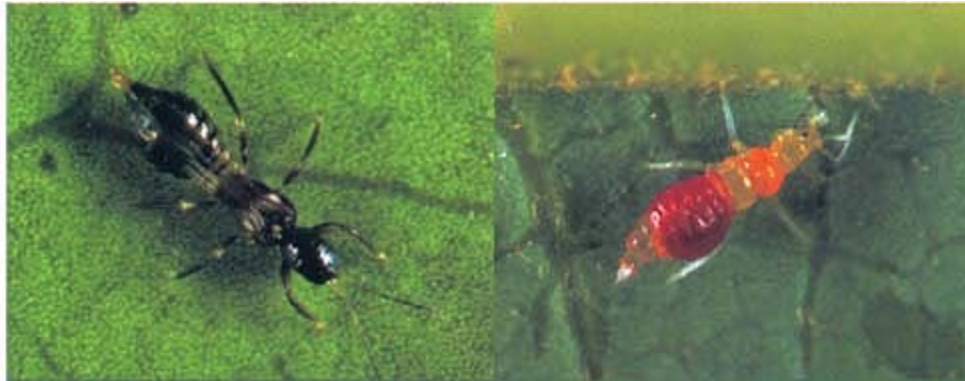
Fruit drop, fruit scarring, leaf & branch damage

# Controls

biological – Chrysoperla spp.

chemical – spirotetramat, abamectin, spinetoram

Jack Kelly Clark



The researchers scoured Mexican and Central American avocado orchards for natural predators of avocado thrips. They found the predatory thrips *Franklinothrips orizabensis*, left (larva) and right (adult). Also native to California, this predator is now being reared and tested as a possible biological control agent.

# Diaprepes root weevil (*Diaprepes abbreviatus*)







**270 species of plants**  
**citrus, avocado,**  
**Brazilian pepper,**  
**peanut, sorghum**

**Roots and shoots**

DIAPREPES ROOT WEEVIL  
NEWPORT BEACH, ORANGE COUNTY  
2005



3 sq. km area  
near Los Angeles



★ FIND SITE  
..... QUARANTINE BOUNDARY (3 SQ. MI.)

## Controls

adults – imidicloprid,

larvae – imidicloprid, Steinernema spp.

eggs – foliar oil sprays

# An Ecological Disaster Coming our Way?



6 months from infection to collapse  
Florida

# Laurel Wilt Disease

*Raffaelea lauricola* fungus  
and others

spread by

*Redbay Ambrosia Beetle*

*Xyleborus glabratus*

and others





Strings of compacted ambrosia  
beetle sawdust

# Distribution of Counties with Laurel Wilt Disease\* by year of Initial Detection

July 21, 2021

Laurel Wilt Disease is a destructive disease of redbay (Fraxinus floridana) and other species within the laurel family (Lauraceae) caused by a vascular wilt fungus (Hollardia laevis) that is vectored by the redbay ambrosia beetle (Xyleborus glabratus). The pathogen has been confirmed through laboratory analysis of host samples collected in the counties highlighted.





# Pest-Disease Complex

Ambrosia Beetles (>34,000 species world-wide)

order: coleoptera

Characterized by boring into trees and forming galleries in the sapwood.

Beetle carries and fungus which digests the wood disrupting the flow of water and nutrients

The adult and larvae feed on the mycelium and spore clusters of the fungus

Typically attack trees under stress (e.g. drought)

It only takes **one** beetle to cause the infection

No good control.

Spread by people carrying wood.

Adult beetles easily killed by many insecticides

Registration is being sought  
for propiconazole fungicide



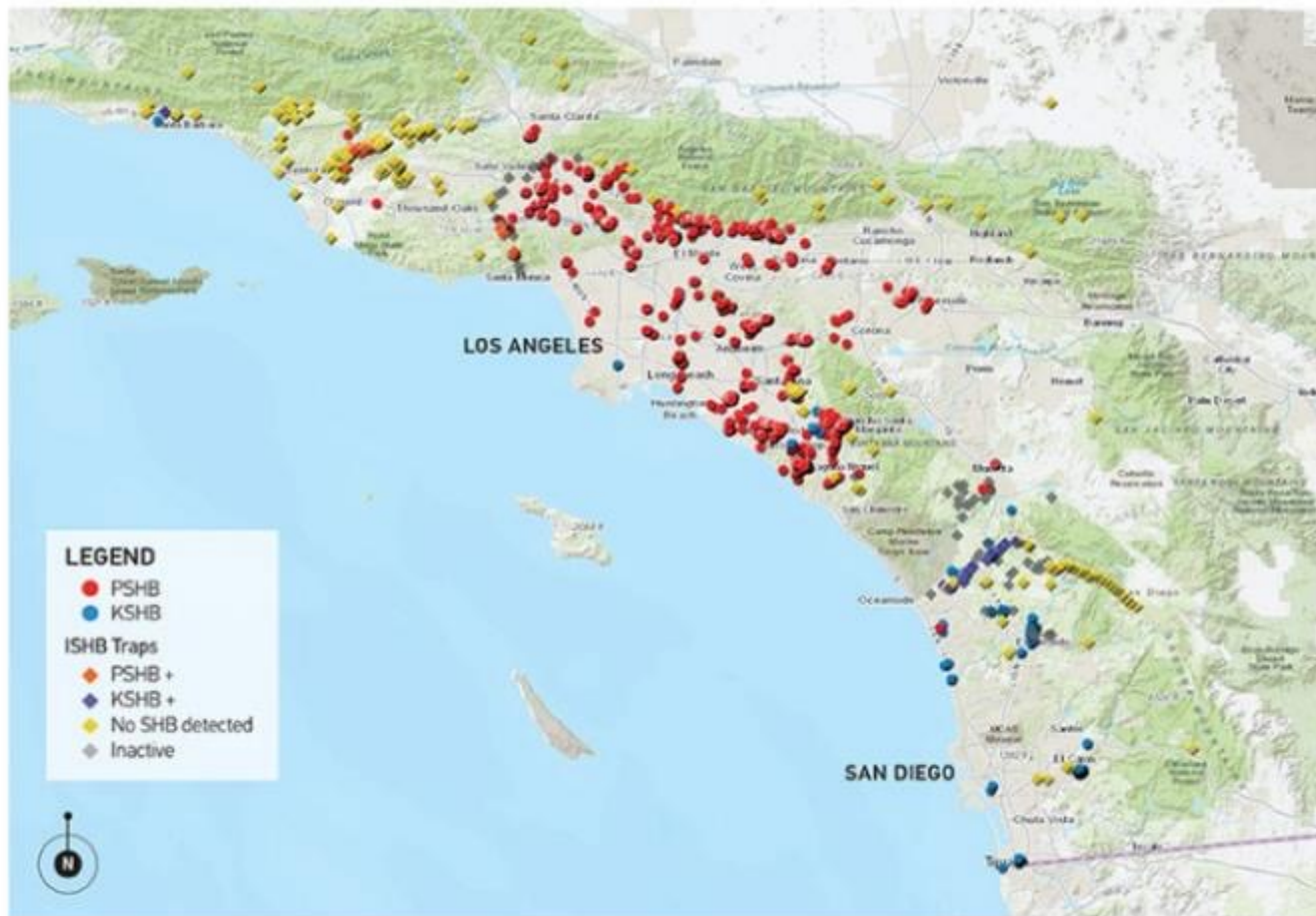
# **Invasive Shot Hole Borer - Polyphagous Shot Hole Borer Kuroshio SHB and various Fusarium fungi**

Unlike Laurel Wilt  
this goes to over 200 tree  
species.



**Known Suitable Hosts:** Box Elder (*Acer negundo*), Castor bean (*Ricinus communis*), Avocado (*Persea americana*), English Oak (*Quercus robur*), California coast live oak (*Quercus agrifolia*), Big leaf maple (*Acer macrophyllum*) silk tree (*Albizia julibrissin*) Liquidambar (*Liquidambar styraciflua*), Coral tree (*Erythrina coralladendron*), Titoki tree (*Alectryon excelsus*), California sycamore (*Platanus racemose*) and Blue Palo Verde (*Cercidium floridum*).

Also found in  
Israel



Decline is very slow in avocado. Affects water/salt/heat stressed trees the most

No good control.

Spread by people carrying wood.

Beetles easily killed by many insecticides when outside of the tree. Spend most of their lives in the tree – can't kill



*Paraleyrodes* - Nesting Whitefly pupa

*Tydeid* mite  
cleaning up  
whitefly wax





Caloptilla sp.  
Leaf roller/miner

So far only goes to  
young leaves



So what's next?





# Glassy-winged Sharpshooter

Leaf scorch



In Guatemala

*Xylella fastidiosa*



## Avocado Trioza

<http://biocontrol.ucr.edu/research.html>



In Mexico and Central America

Mark Hoddle



## Avocado Seed Moth – *Stenoma catenifer*



In Central America



# Poll Question 3

Brown garden snail is mainly a problem ...

- a. in old trees
- b. in trees with no coarse leaf mulch
- c. when trees are young
- d. high rainfall years
- e. with frequent irrigations

# *Integrated Pest Management for Avocados (2008)*



INTEGRATED PEST MANAGEMENT FOR

## Avocados

**For more information:**  
[ucanr.edu/ipm-avocado](http://ucanr.edu/ipm-avocado)

**To order:**  
**Call: 1-800-994-8849**  
**Web: [anrcatalog.ucanr.edu](http://anrcatalog.ucanr.edu)**  
**Email: [anrcatalog@ucanr.edu](mailto:anrcatalog@ucanr.edu)**

STATEWIDE INTEGRATED PEST MANAGEMENT PROGRAM  
UNIVERSITY OF CALIFORNIA AGRICULTURE AND NATURAL RESOURCES  
PUBLICATION 3503

*Solve your pest problems with UC's best science*

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- Home & Garden Pest Newsletter: [Summer](#)
- Pest Notes: [Nutsedge](#), [Rats](#), [Damping-off Diseases in the Garden](#) updated, [Invasive Shothole Borers](#), [Feral Cats](#) and [Botryosphaeria Canker](#) added
- [Pesticide active ingredients database](#)
- [Green Bulletin: Spring 2024](#)
- [New video: Identification and Management of Lygus Bug](#)
- [Sahara mustard and Stinknet](#)
- [Urban Pesticides, Fertilizers, and Water Quality](#)
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Agriculture: Pest Management Guidelines

# Avocado

Co-located on web with UCIPM Pest Management Guidelines for Avocado

University of California's official guidelines for pest monitoring techniques, pesticides, and nonpesticide alternatives for managing pests in agriculture. [More](#)

## Year-Round IPM Program

- [Introduction](#)
- [Bloom](#)
- [Early Fruit Development](#)
- [Late Fruit Development](#)
- [Harvest](#)
- [Pesticide Application Checklist](#)

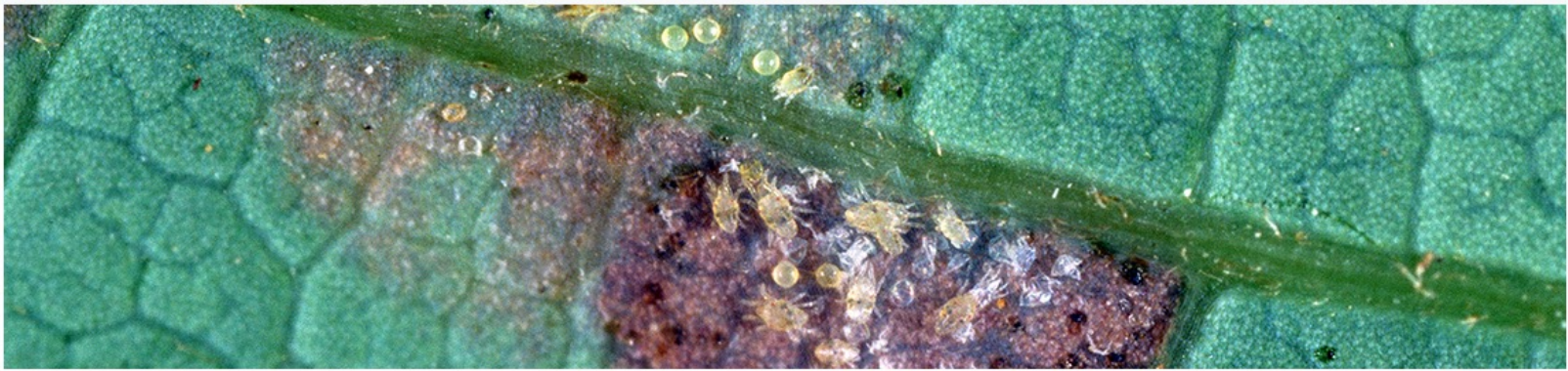
Publication Information

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## General Management in an IPM Program

- [Fertilization](#)
- [Frost Injury and Control](#)
- [Manipulating Cultural Practices and Growing Conditions](#)
- [Minimize Fruit Injury and Postharvest Disease](#)



## Agriculture: Avocado Pest Management Guidelines

# Persea Mite

*Oligonychus perseae*



### On This Page

- Mite Pests of Avocado—General Information
- Description of the Pest
- Damage
- Management
- Important Links

## Mite Pests of Avocado—General Information

Spider mites (family Tetranychidae) and predatory mites (Phytoseiidae) are tiny eight-legged arthropods (larval stages have only six legs). Persea mite is a key pest of California-grown avocados. Avocado brown mite and sixspotted mite are sporadic pests. Several beneficial mites are important predators of pest mites and certain insects. Natural enemies and certain management strategies vary among pest mites. Identify the pest and natural enemy species in your grove and learn their biology so you can manage these pests appropriately as needed. For details about sampling techniques, see [MONITORING PERSEA AND SIXSPOTTED MITES](#).



## Description of the Pest

[\(View photos to identify mites\)](#)

Persea mite (family Tetranychidae) is a key pest that occurs in most avocado-growing areas of California except the Central Valley. Many ornamentals and weeds also host perseae mite. When perseae mites were first introduced into California in the early 1990s, individual mites from large populations on avocado trees were seen drifting onto leaves of adjacent stone fruit trees, although they did not feed. Since that time, however, numbers have been reduced and perseae mites have not been observed on stone fruit trees or fruit, and *Prunus* species are not known to be a host of this mite.



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## Avocado

### Identifying Mites and Their Damage, and Predatory Mites

#### On this page

##### [Pest mites](#)

- Avocado brown mite
- Persea mite
- Sixspotted mite

##### [Natural enemies](#)

- *Amblyseius (Neoseiulus) californicus*
- *Galendromus helveolus*
- *Euseius hibisci*
- Predatory and pest mite egg comparison

Names link to more information on identification and management.

#### Pest mites—Click on photos to enlarge

[Avocado brown mite](#)

**Identification tip:** Avocado brown mite is dark to brown and lays amber to brown eggs.

[Persea mite](#)

**Identification tip:** Persea mite is yellow to green with 2 or more dark blotches on its body.

[Sixspotted mite](#)

**Identification tip:** Sixspotted mite is yellowish with 6 dark blotches on its body.

[Avocado brown mite damage](#)

**Identification tip:** Avocado brown mite damage causes bronzing or brown discoloration on the upper leaf surface. Silk webbing is not obvious.

[Persea mite damage](#)

**Identification tip:** Persea mite damage forms distinct circular, yellow or brown spots along veins on the leaf underside. Spots become visible through the upper leaf surface. The mites feed under dense silvery silken patches.

[Sixspotted mite damage](#)

**Identification tip:** Sixspotted mite damage forms brown to purplish irregular blotches or relatively continuous discoloring along veins on the leaf underside. Webbing is light, not in distinct round patches.

**For more information, visit our website at  
[www.ipm.ucanr.edu](http://www.ipm.ucanr.edu)**

