

# Urban Trees and Pests

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Slides courtesy of  
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Agriculture and Natural Resources

Cooperative Extension

CISR, UC Riverside

A close-up photograph of a dark beetle, likely a longhorn beetle, working on a nest made of twigs and soil. The beetle has a dark, almost black body with reddish-brown legs and antennae. It is positioned on a mound of brown soil and twigs, with its head and antennae focused on the material. The background is a soft, out-of-focus green, suggesting a natural outdoor setting.

# Outline

**When things go wrong** *pests, pests, pests!*

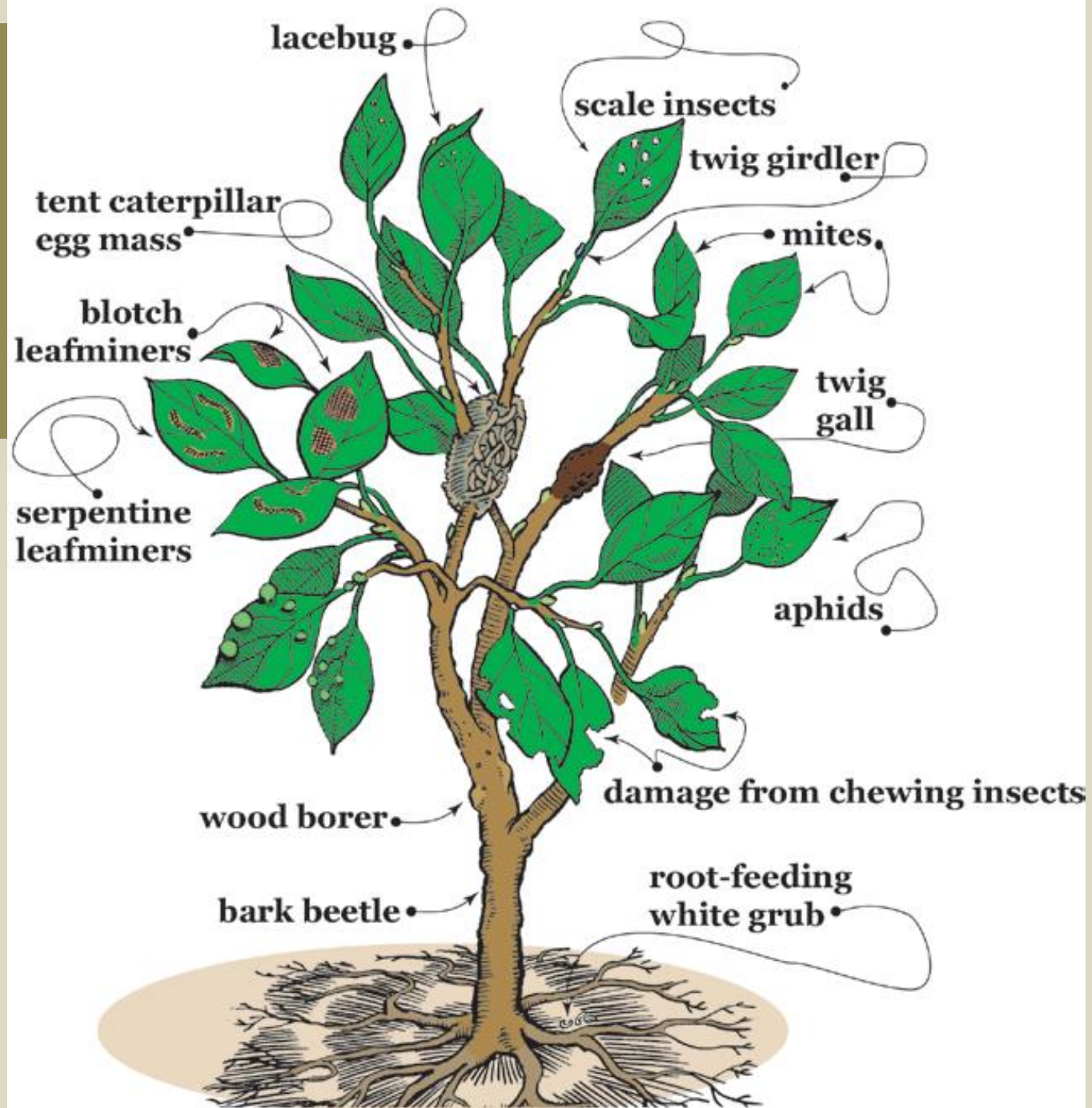
**Tree parts** *and what can be eaten*

**Some old pests** *and their management*

**Some new pests** *upcoming attractions*

**UC Resources and Discussion**

What  
looks  
edible  
here...?





Stunted growth



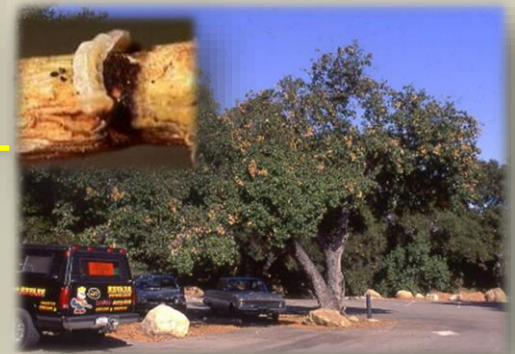
Fungal twig dieback  
*Cryptocline*



Fungal branch dieback  
*Diplodia*



Stem cankers & terminal secondary decay fungi



Twig girdlers *Agrilicus*  
Foliar insects, oak pit scale



Trunk insects & associated fungi



Root rots, *Armillaria*  
Soilborne Phytophthoras



Canker rots,

## Basic ideas...

- Pests:

Abiotic vs Biotic	Primary vs Secondary	Insects vs Diseases	Foliar vs “Wood”
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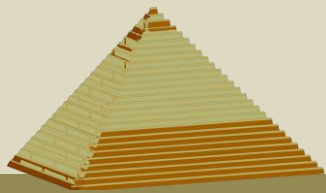
- Categories are not exclusive (or always useful)
- Symptoms often look alike
- Pest combinations or sequences are common

## Basic ideas, continued

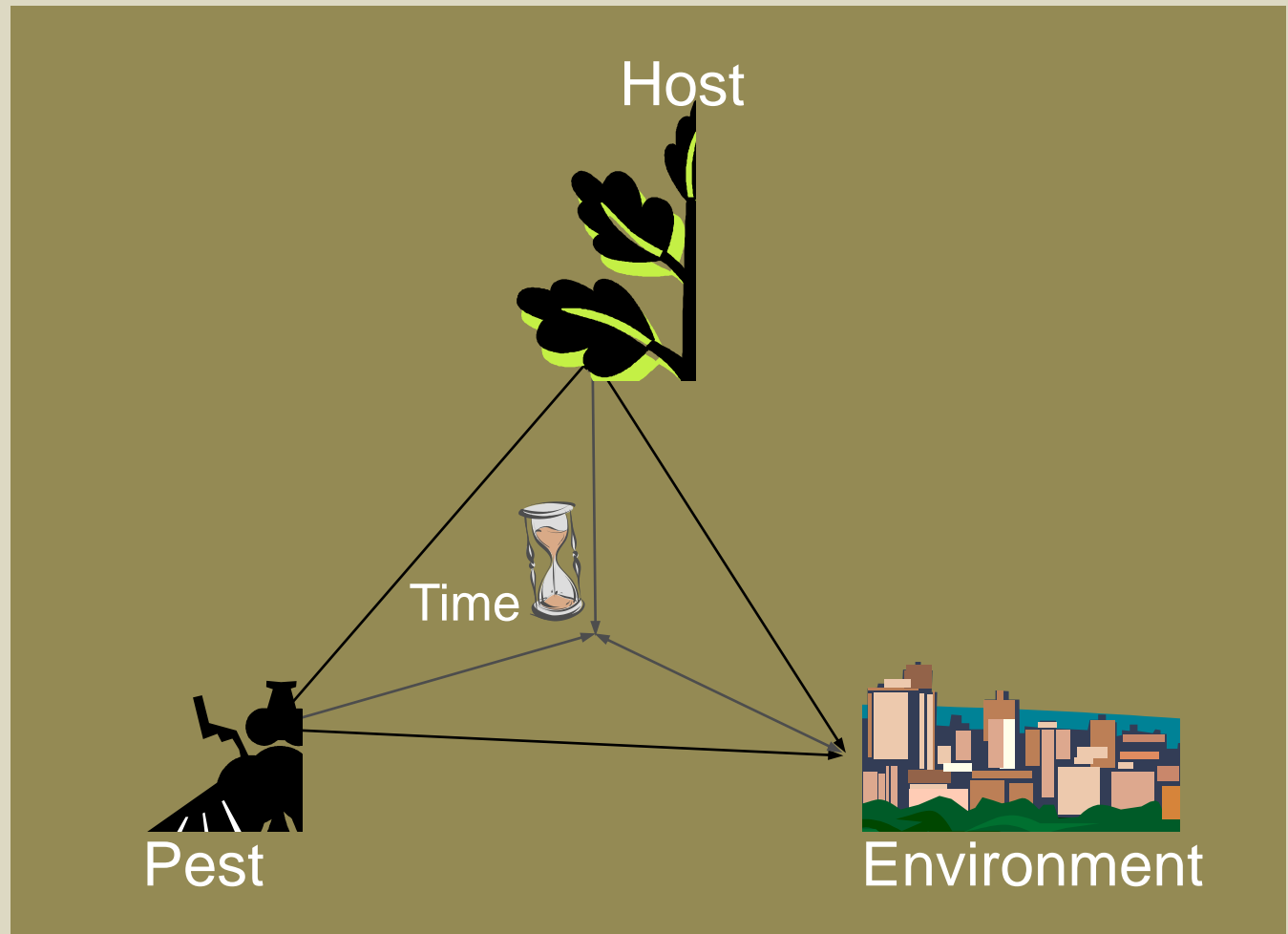
<b>Abiotic vs Biotic</b>	<b>Primary vs Secondary</b>	<b>Insects vs Diseases</b>	<b>Foliar vs “Wood”</b>
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- Abiotic problems important, often first
- Secondary pests common, important
- Insects visible (signs) vs. disease symptoms
- Foliars prominent, but “wood” pests lethal
  - Diebacks, cankers, vascular wilts

# four elements of a pest problem



Plant pathology



# Trees and drought: problematic in several ways...

- ~ Trees need water to “feed themselves” (photosynthesis)
- ~ Drought = reduction in growth (which may persist)



Watson and Himelick, 2013



Cultural/physical control:  
make the environment better

or: tree stress often leads to pest success...



**Mulch reduces weeds,  
soil compaction and  
water loss, and  
improves plant growth**



**Whitewash  
trunks to  
prevent  
sunburn**



# Mech/cultural control example: Eucalyptus longhorn borer



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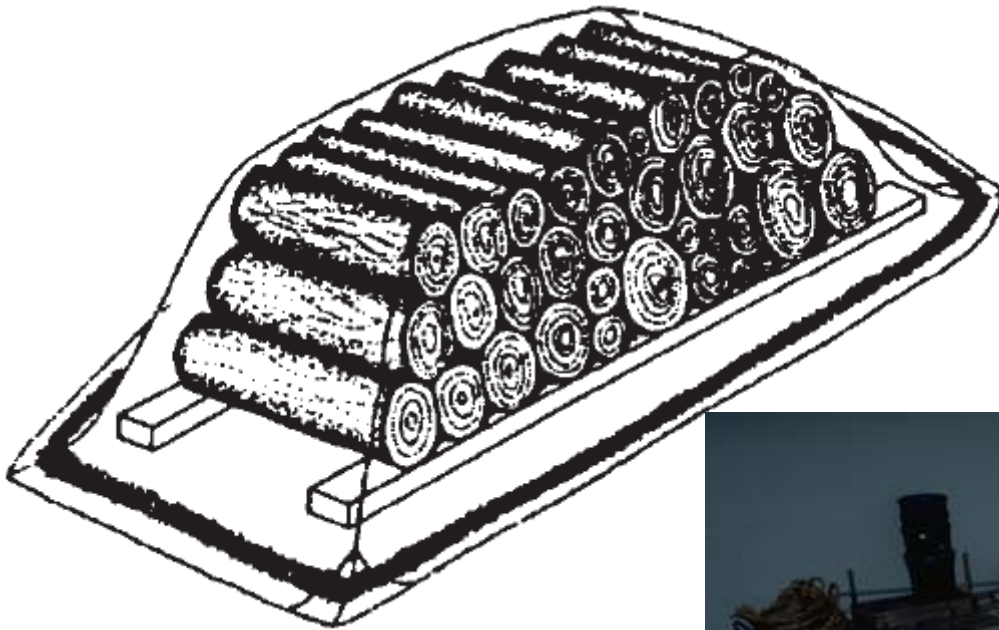


Project  
University of California

# Mech/cultural control example: Eucalyptus longhorn borer

## MANAGEMENT

...reduce tree stress,  
properly handle  
eucalyptus wood,  
plant resistant species,  
and avoid activities that  
disrupt biological control.



# Outline

When things go wrong *pests, pests, pests!*

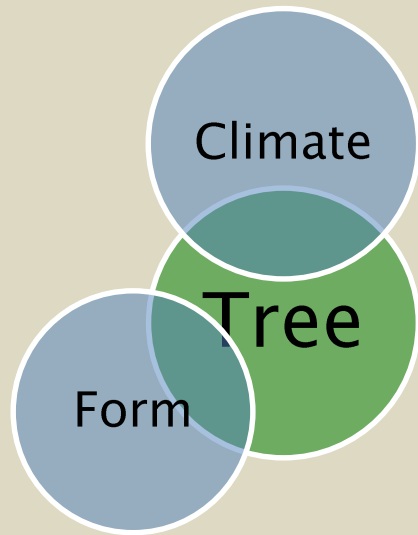
Tree parts *and what can be eaten*

**Some old pests** *and their management*

Some new pests *upcoming attractions*

**UC Resources and Discussion**

# Another example of old problems



Powdery mildew on plane trees

**Cultivars resistant (and not)**





# Sycamore/Planetree Powdery Mildew

## Powdery mildews:

<> fungal disease

<> many pathogens,  
even more hosts

<> Some are  
host-specific

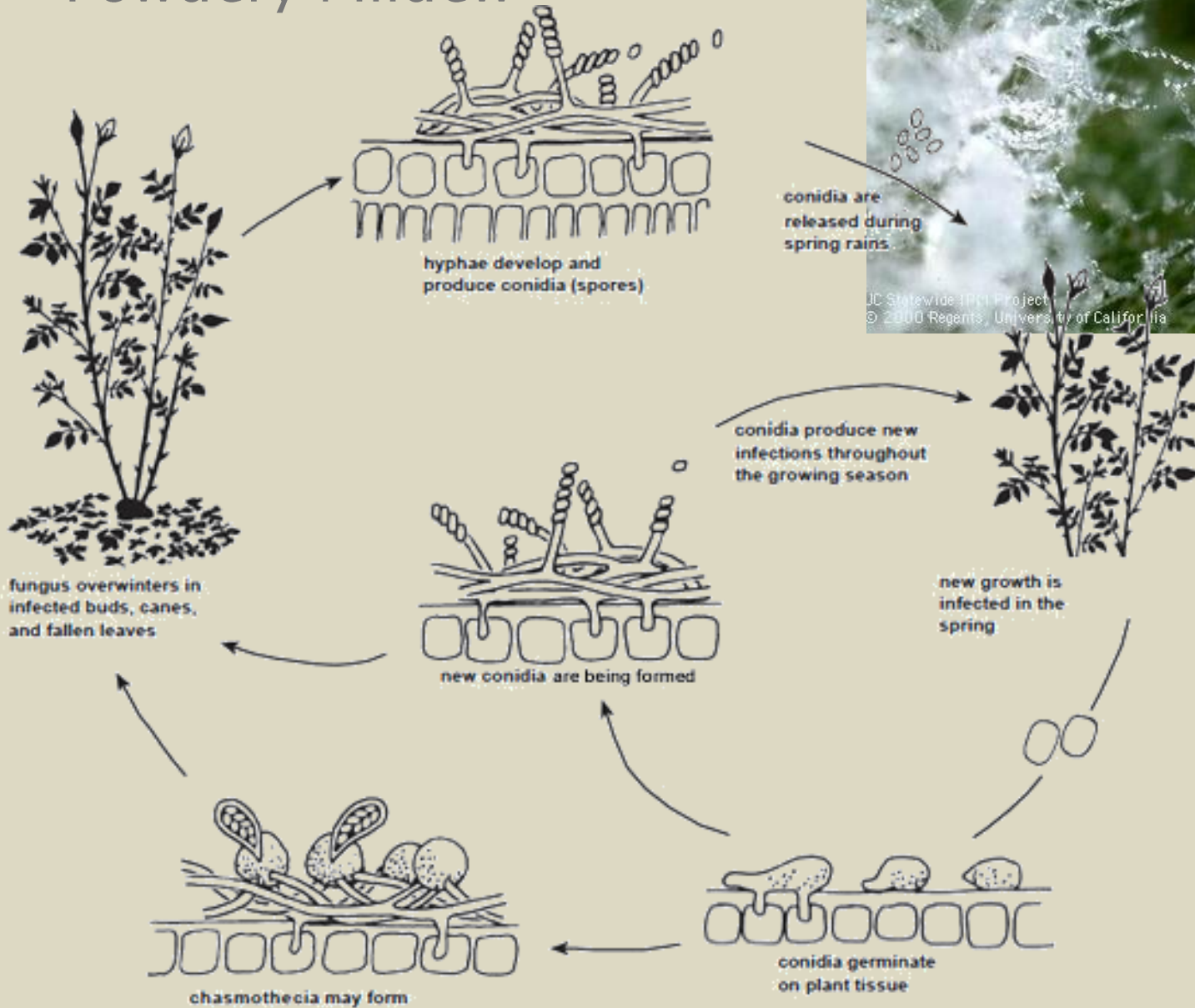
<> Like moisture, but not water

<> Like shade, humidity, density

<> For planetree: *Erysiphe platani* (= *Microsphaera* p.)



# Powdery Mildew



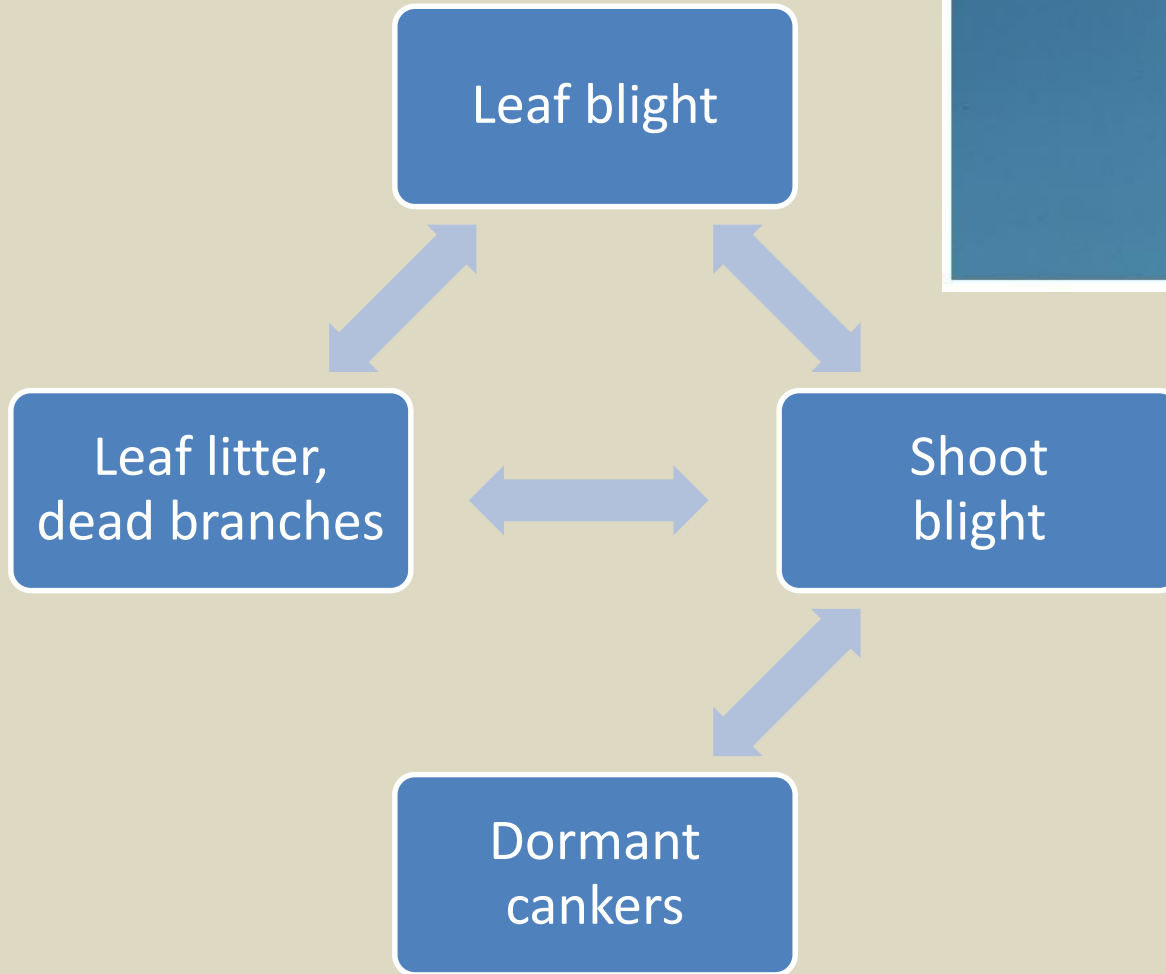


# Sycamore/Planetree Powdery Mildew

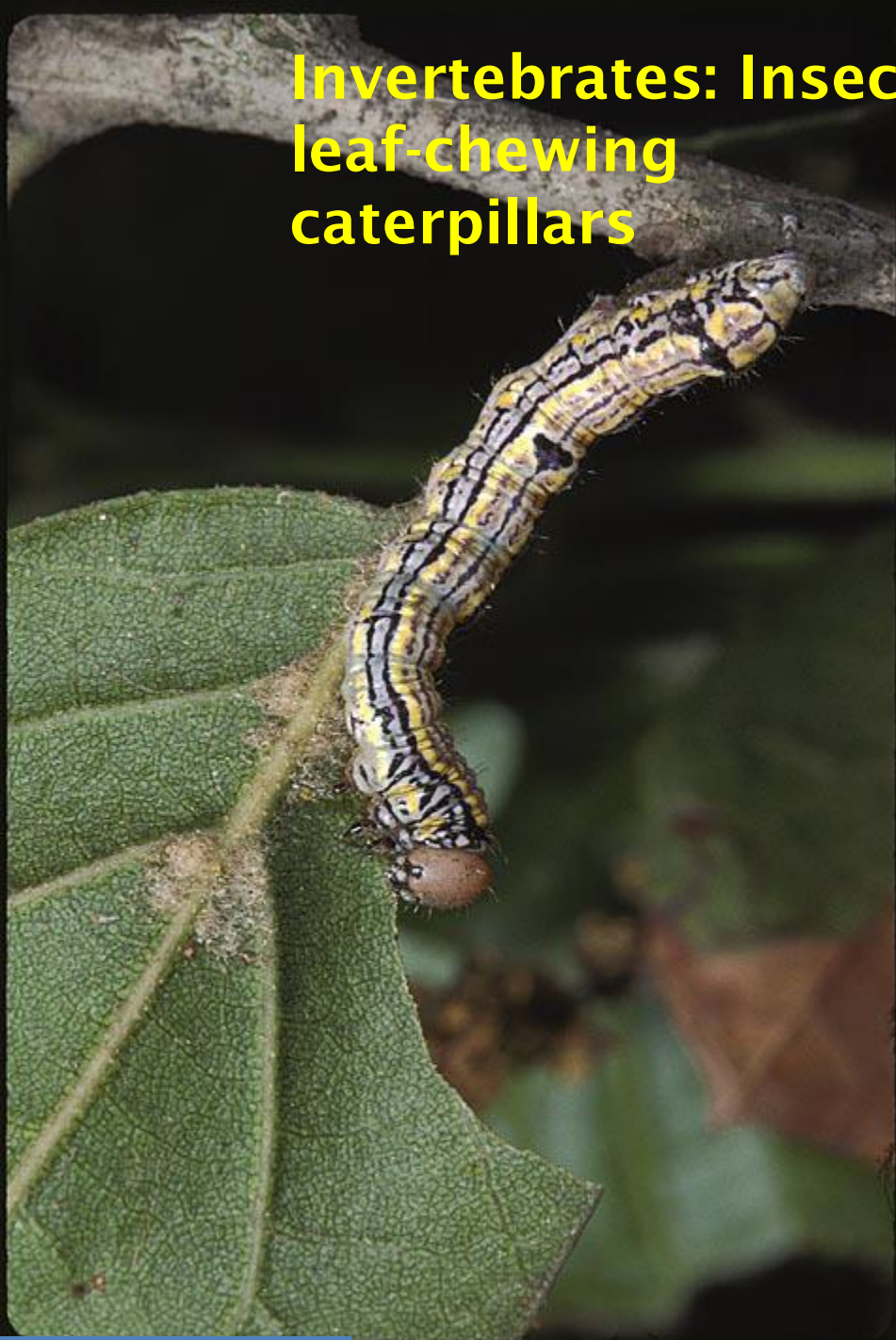
## Management

- >> fungicides impractical (protectant, not curative)
- >> importance of sanitation: remove dropped leaves and other plant material
- >> can try improving airflow – but do not over-prune!
- >> Resistant cultivars are available – use them!  
(Columbia; or Yarwood for pollarded trees)

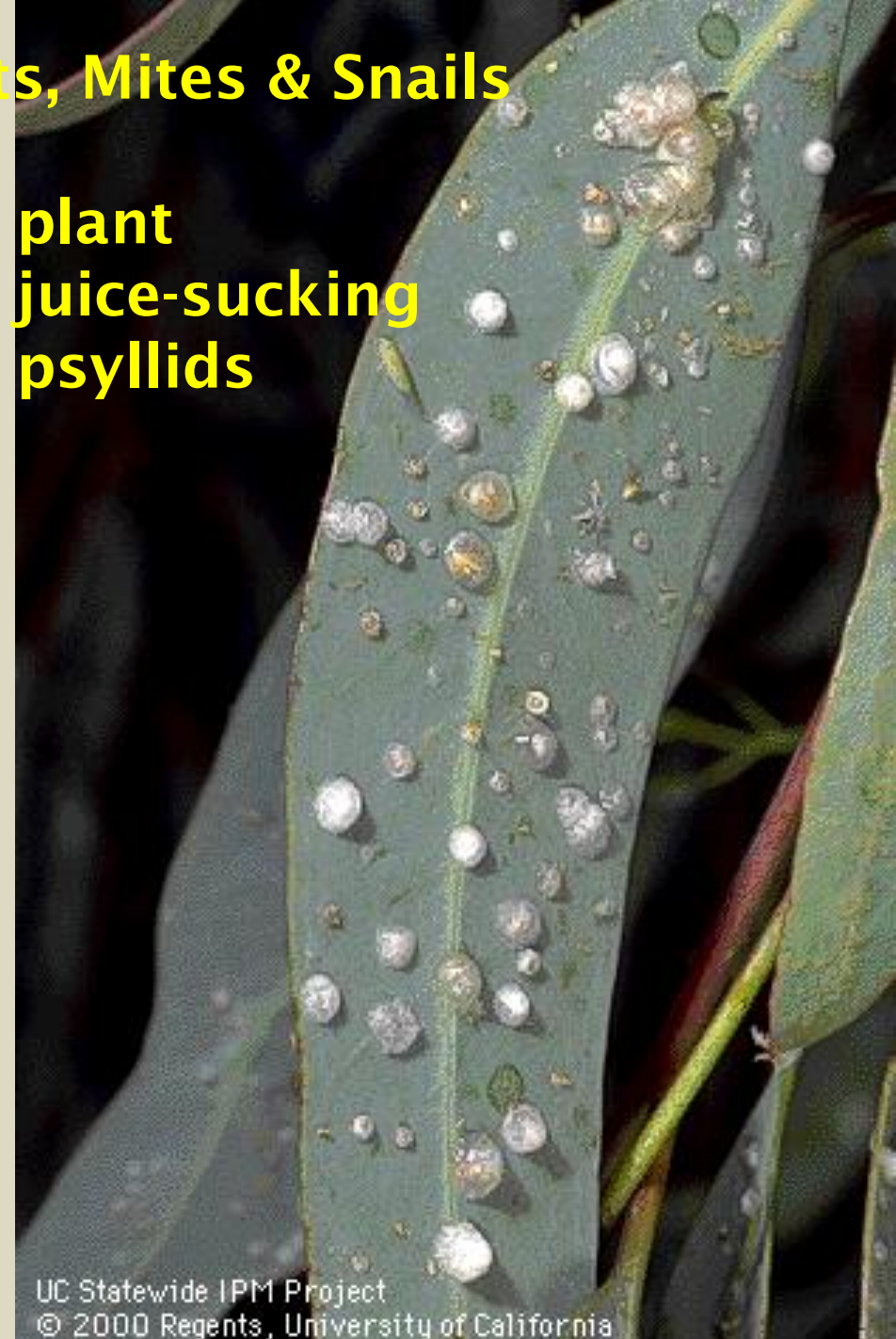
# Sycamore/Planetree Anthracnose



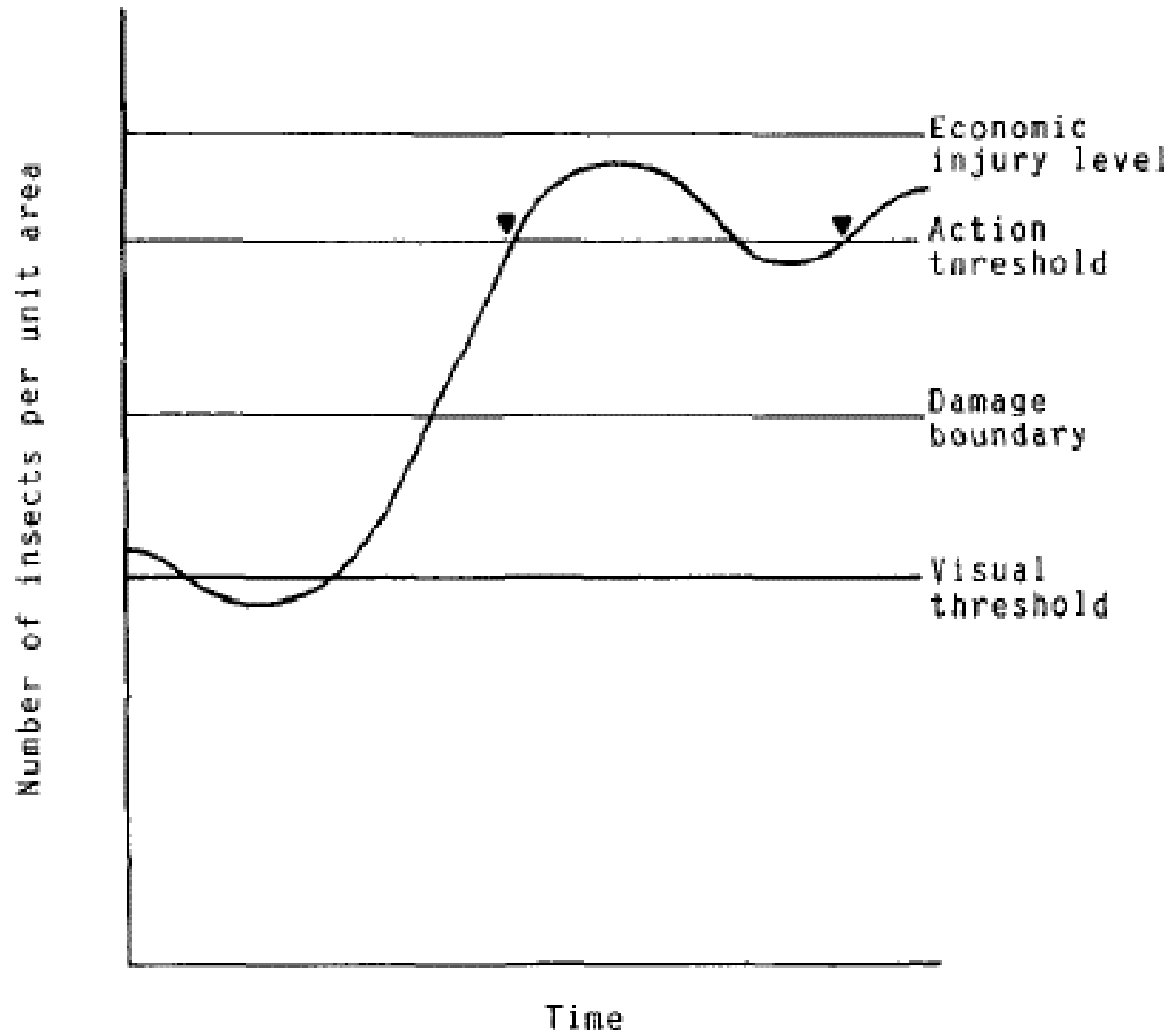
**Invertebrates: Insects, Mites & Snails  
leaf-chewing  
caterpillars**



**plant  
juice-sucking  
psyllids**



# Thresholds



# Thresholds example:

UNIVERSITY OF CALIFORNIA AGRICULTURE & NATURAL RESOURCES

UC IPM

Statewide Integrated Pest Management Program

[UC IPM Home](#) > [Homes, Gardens, Landscapes, and](#)

[How to Manage Pests](#)

**Pests in Gardens and Landscapes**



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HOME

SEARCH

ON THIS SITE

What is IPM?

Home & landscape pests

Agricultural pests

Natural environment pests

Exotic & invasive pests

Weed gallery

## California Oakworm

Revised 4/09

[Download PDF](#)

In this Guideline:

- [Identification](#)
- [Management if oaks might be sprayed](#)
- [Life cycle](#)
- [About Pest Notes](#)
- [Damage](#)
- [Publication](#)
- [Management](#)
- [Glossary](#)

The California oakworm (*Phryganidia californica*, family Diopitidae) range, which extends along the coast and through the coastal



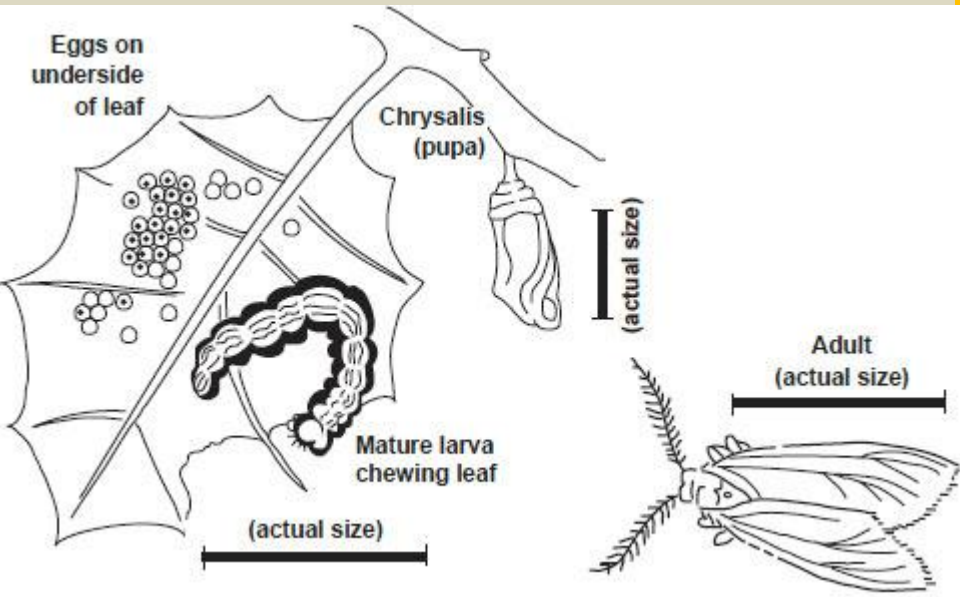
UC Statewide IPM Project  
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# Thresholds example: Oakworm

“...If you observe more than 8 to 10 oakworms more than 1/4 inch long, defoliation may occur if oaks are not sprayed.

Alternatively, a density of 25 oakworms per 100 shoot terminals has been suggested as a treatment threshold.”



fear...

vs.

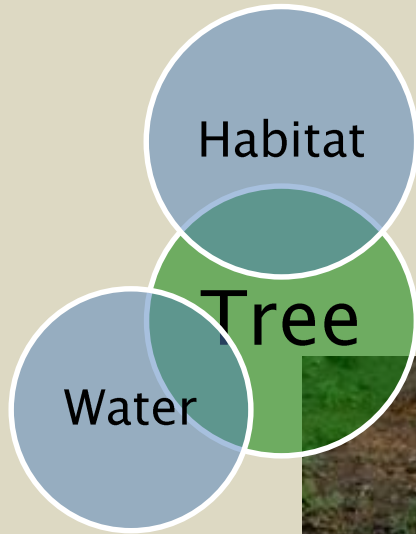
reality...







# *Armillaria* as example old problems...



Oak root fungus

**Poor cultural practices**

Untreatable, lethal



# *Armillaria* signs: mycelium



University of California



# *Armillaria* signs: rhizomorphs



Photo: Eric Steinert, Munich.

# *Armillaria* diagnosis and management

- Kendra Baumgartner found that root collar excavations in grape gave partial control of *Armillaria* in vineyards.



Example of a  
vascular wilt

Dutch Elm Disease  
(*Ophiostoma ulmi*)



Waukegan (Illinois, USA)



# Insect Examples: Bark beetles and Ambrosia beetles



# Combo example: Pitch canker

Individual infections, that  
may progress down the  
branches



# Pitch canker – *Fusarium circinatum* (“pine pitch canker”)

Host: Pines (but mostly  
Monterey pine, *Pinus  
radiata*)

Vector: several twig  
beetles, engraver beetles,  
and cone beetles



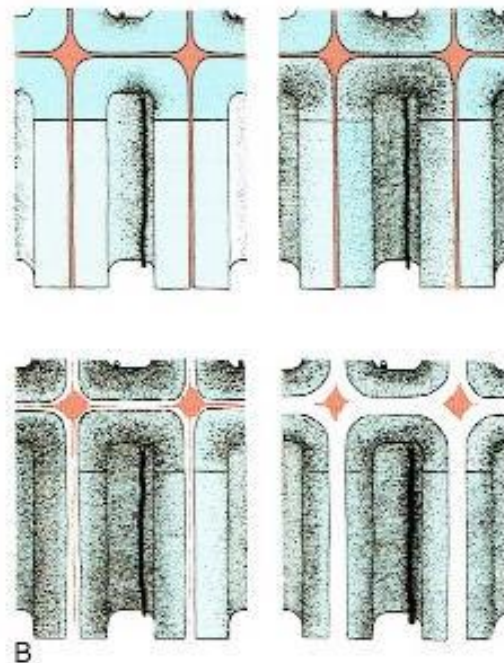
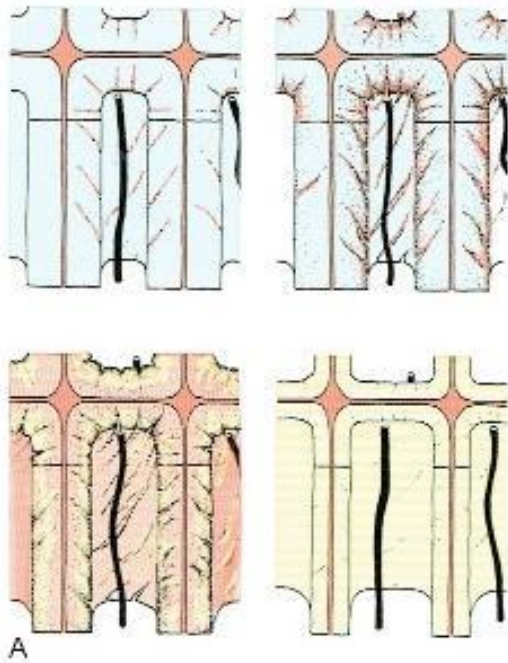


# Wood decay fungi...



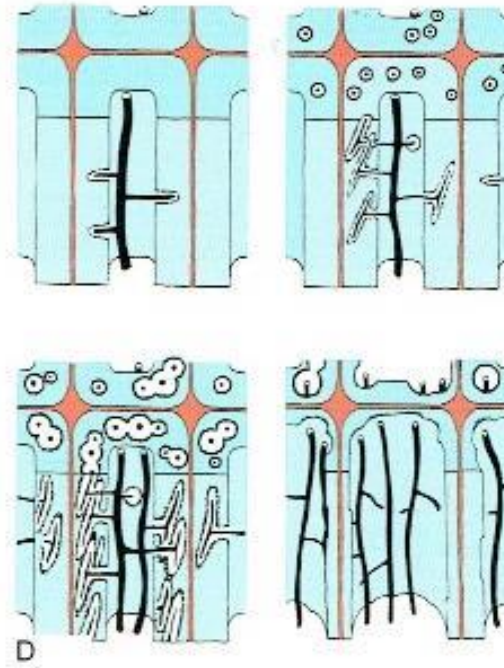
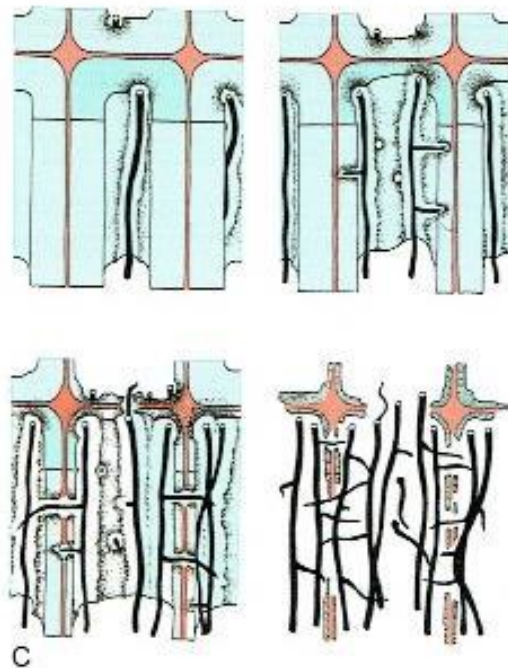
decay  
types

brown



white

white  
- sim.

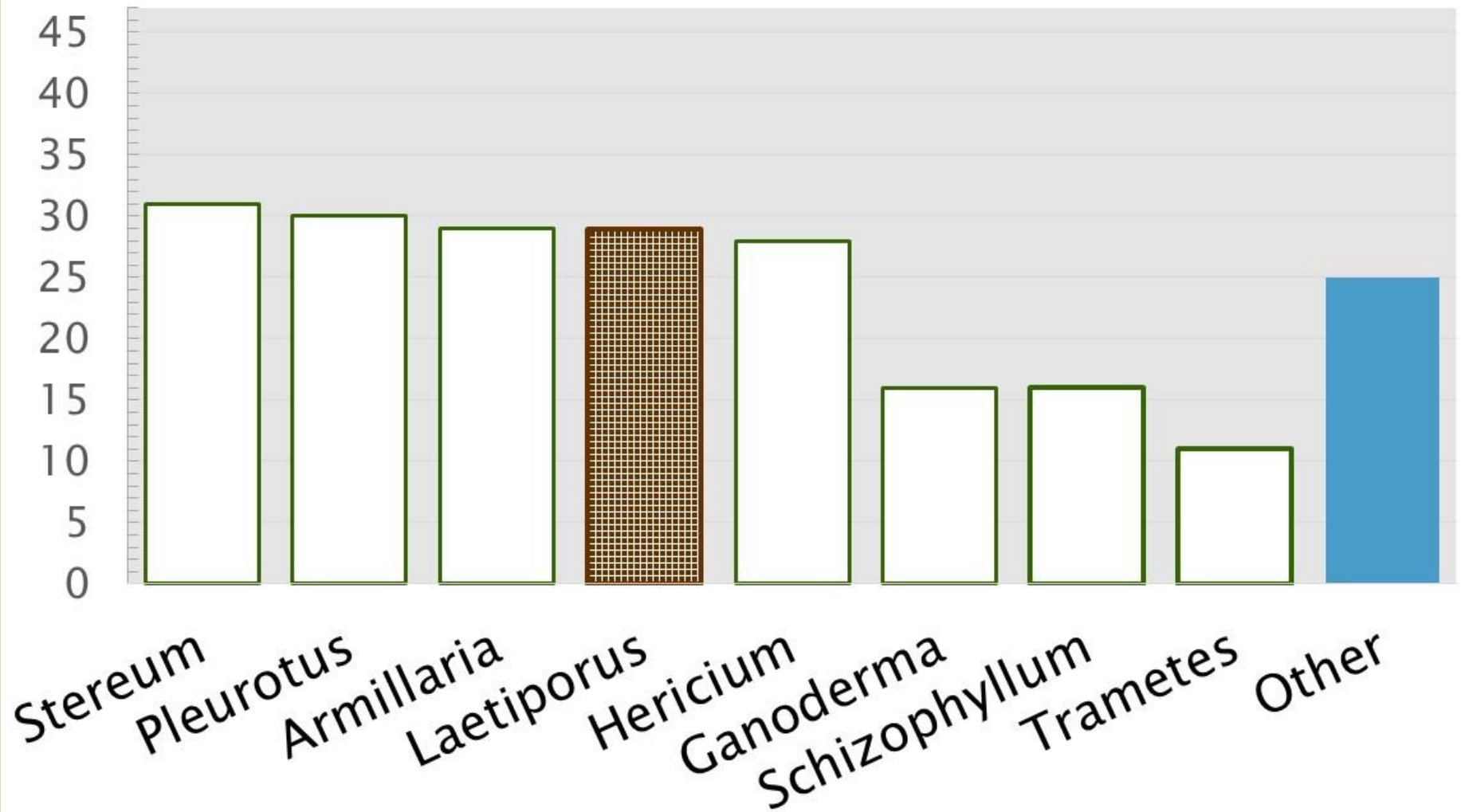


soft

From:  
Schwarze  
2008

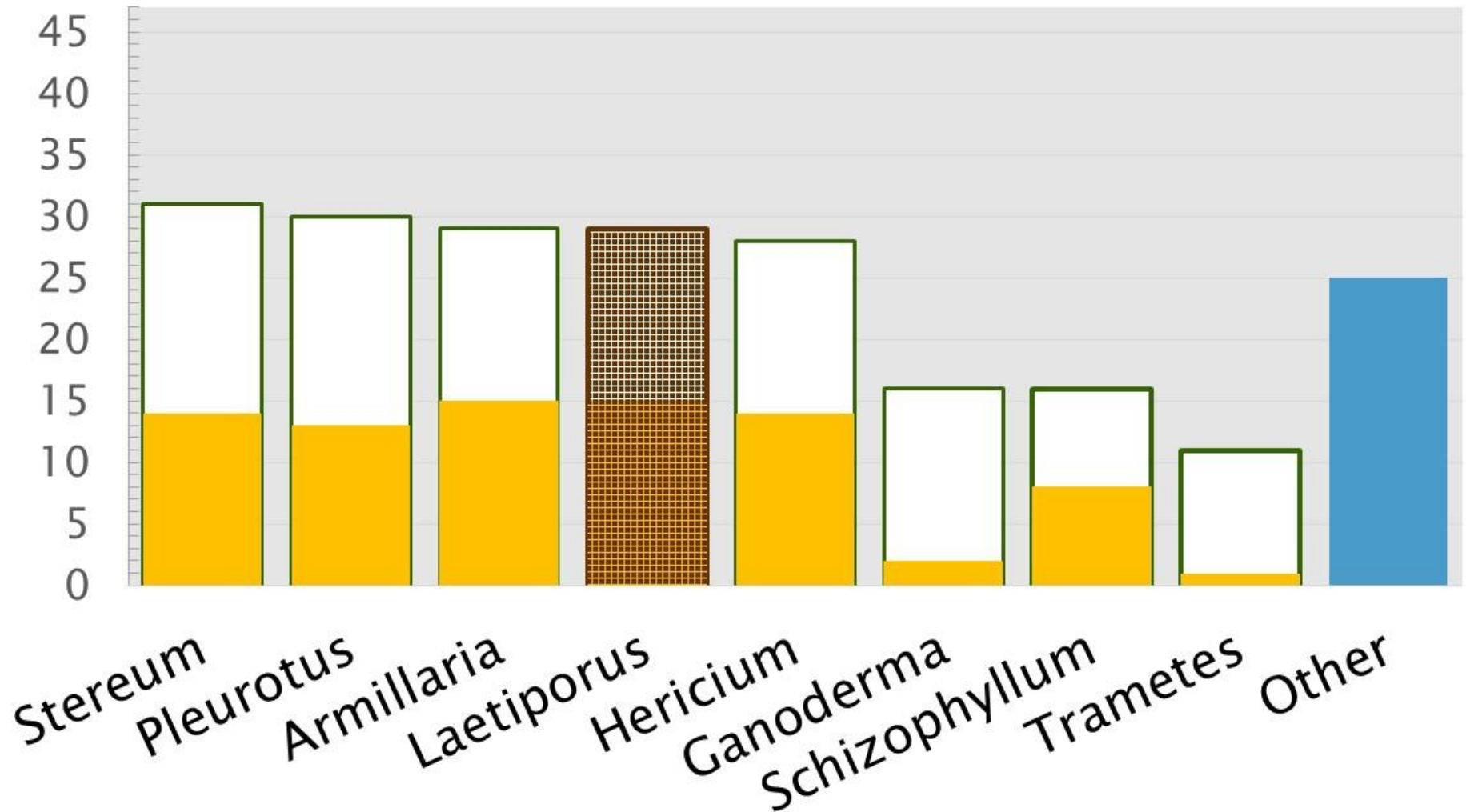
# Preliminary results: fungal taxa

Count of fungi (total: 215) from 78 samples



# Preliminary results: fungal taxa

Decay was suspected in only half of reports...



# Discussion: who are they, anyway...



*Stereum hirsutum*

*Armillaria mellea* cluster



*Pleurotus ostreatus*

From:  
Gläser &  
Smith, 2013

# Discussion: who are they, anyway...



*Ganoderma applanatum*



From:  
Glaeser &  
Smith, 2013

# Discussion: who are they, anyway...



*Schizophyllum commune* – top



*Schizophyllum commune* – gills



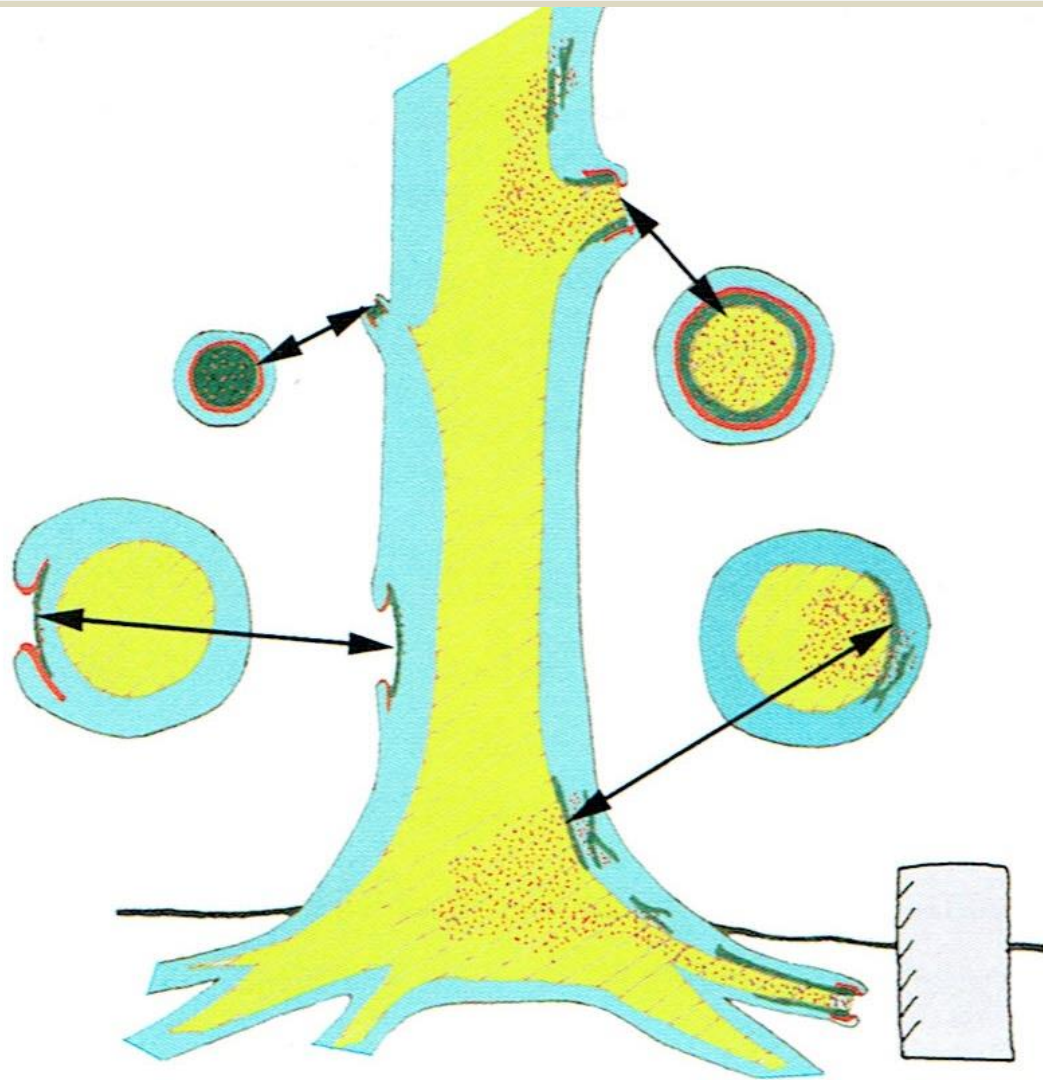
*Trametes versicolor*

*Perenniporia fraxinophila*



From:  
Glaeser &  
Smith, 2010

# Discussion: how did they get in...



**Heartwood / Ripewood**  
**Sapwood**  
**Decayed wood**

**Barrier zone**  
**Reaction zone**

A



## *Dr. Jim Downer says:* Beware of snake oil!

- Products that purport to give you that miracle are termed snake oil.
- Snake oil products almost always offer numerous testimonials to support their use.
- Those who provide testimonials are usually not active, independent, university researchers.

The most creative and effectively marketed snake oil products often cite sound biological facts or knowledge and then attempt to link their product to this knowledge, but references to the published research about their product are always missing.

# Outline

When things go wrong *pests, pests, pests!*

Tree parts *and what can be eaten*

Some old pests *and their management*

**Some new pests** *upcoming attractions*

**UC Resources and Discussion**



Prevention example:  
Goldspotted oak borer  
*Agrilus auroguttatus*



5432189



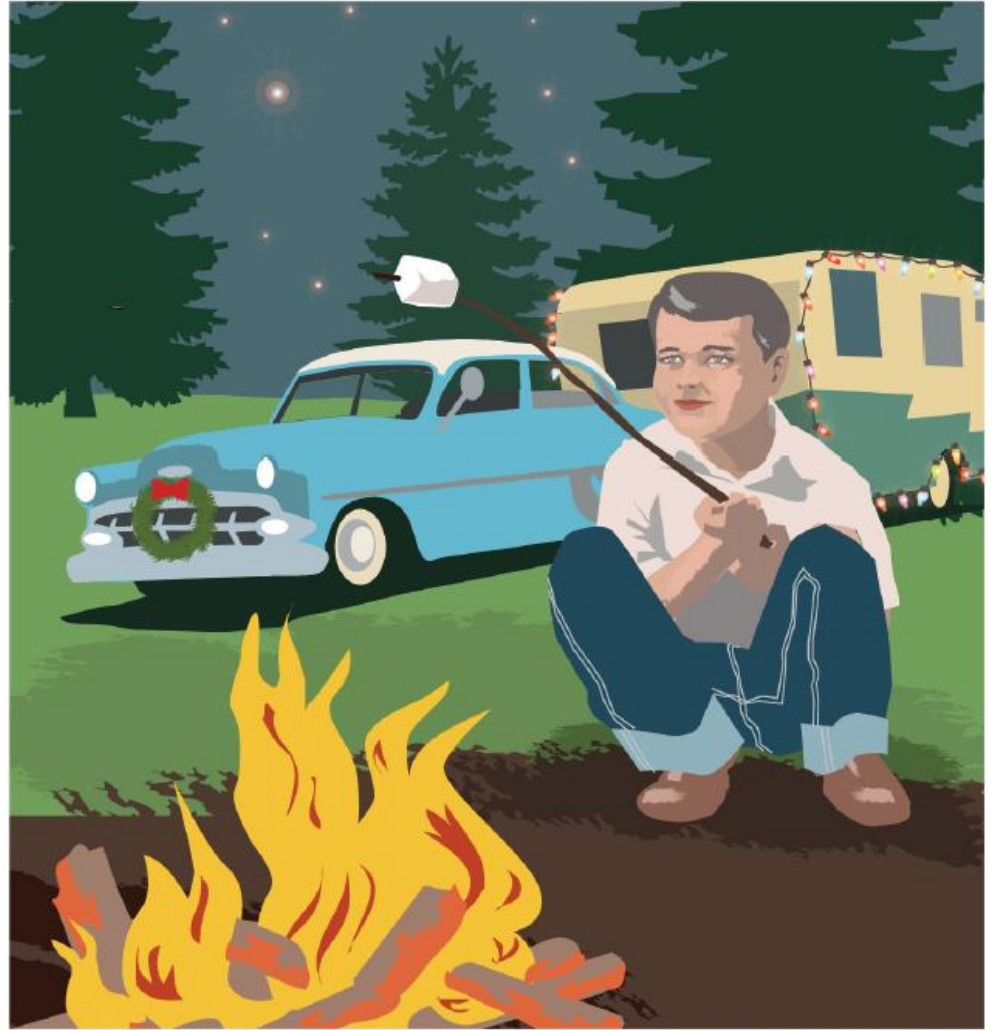
Host: Live oaks (Coast,  
Canyon); California black oak  
Range: Riverside and San  
Diego Counties



CISR, UC Riverside

How did these  
pests get here....?

**WE NEED TREES  
AND TREES NEED US**

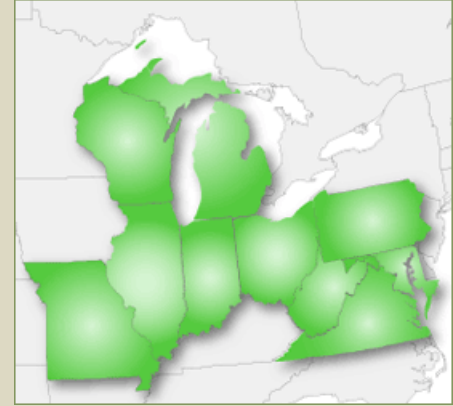


**DON'T MOVE FIREWOOD**

Poster by Ed Lum

pest vulnerability  
leads to disasters (really)

2002 – today  
Emerald ash borer  
(*Agrilus planipennis*)



pest vulnerability  
leads to disasters (really)



2002 – today  
Emerald ash borer  
(*Agrilus planipennis*)



pest vulnerability  
leads to disasters (really)

2002 – today  
Emerald ash borer  
(*Agrilus planipennis*)



# Emerald Ash Borer *Agrilus planipennis*

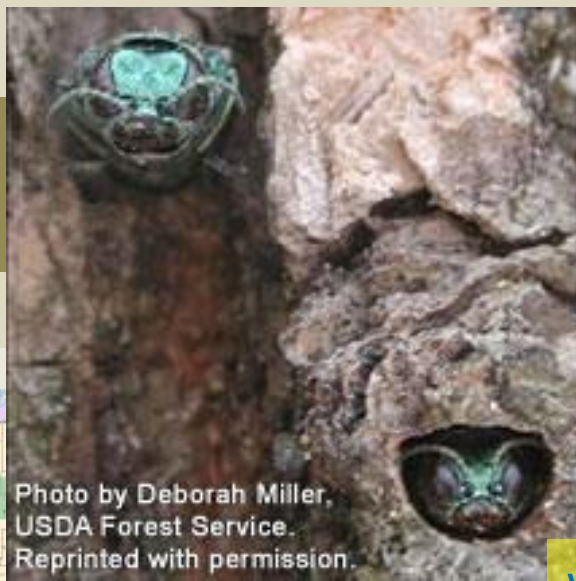


Photo by Deborah Miller, USDA Forest Service. Reprinted with permission.

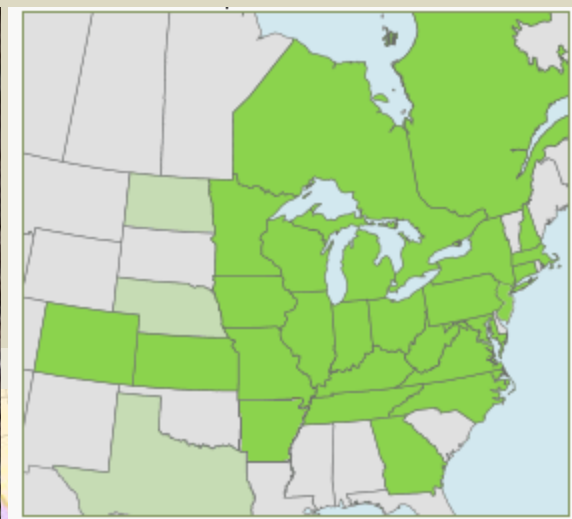
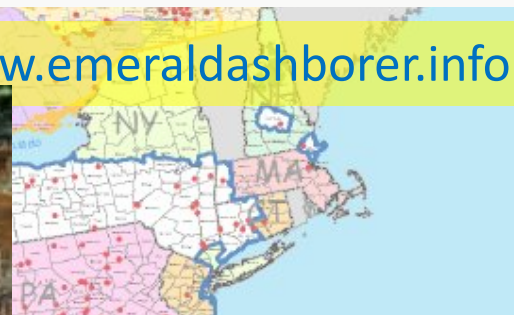


Photo by David Cappaert. Reprinted with permission.



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[www.emeraldashborer.info](http://www.emeraldashborer.info)





# Difficult challenges ahead... Polyphagous shothole borer and Fusarium dieback

1. Box elder (*Acer negundo*)\*
2. Big leaf maple (*Acer macrophyllum*)\*
3. Evergreen Maple (*Acer paxii*)
4. Trident maple (*Acer buergerianum*)
- 5 Japanese maple (*Acer palmatum*)
6. Castor bean (*Ricinus communis*)
7. California Sycamore (*Platanus racemosa*)\*
8. Red Willow (*Salix laevigata*)\*
9. Avocado (*Persea americana*)
10. Mimosa (*Albizia julibrissin*)
11. English Oak (*Quercus robur*)
12. Coast live oak (*Quercus agrifolia*)\*
13. London plane (*Platanus x acerifolia*)
14. Cottonwood (*Populus fremontii*)\*
15. White Alder (*Alnus rhombifolia*)\*
17. Engelmann Oak (*Quercus engelmannii*)\*
18. Cork Oak (*Quercus suber*)
19. Valley oak (*Quercus lobata*)\*
23. Moreton Bay Chestnut (*Castanospermum australe*)
24. Brea (*Cercidium sonora*)
25. Mesquite (*Prosopis articulata*)\*
26. Weeping willow (*Salix babylonica*)
27. Chinese holly (*Ilex cornuta*)
28. Camelia (*Camellia semiserrata*)
29. Acacia (*Acacia* spp.)
30. Liquidambar (*Liquidambar styraciflua*)
31. Red Flowering Gum (*Eucalyptus ficifolia*)



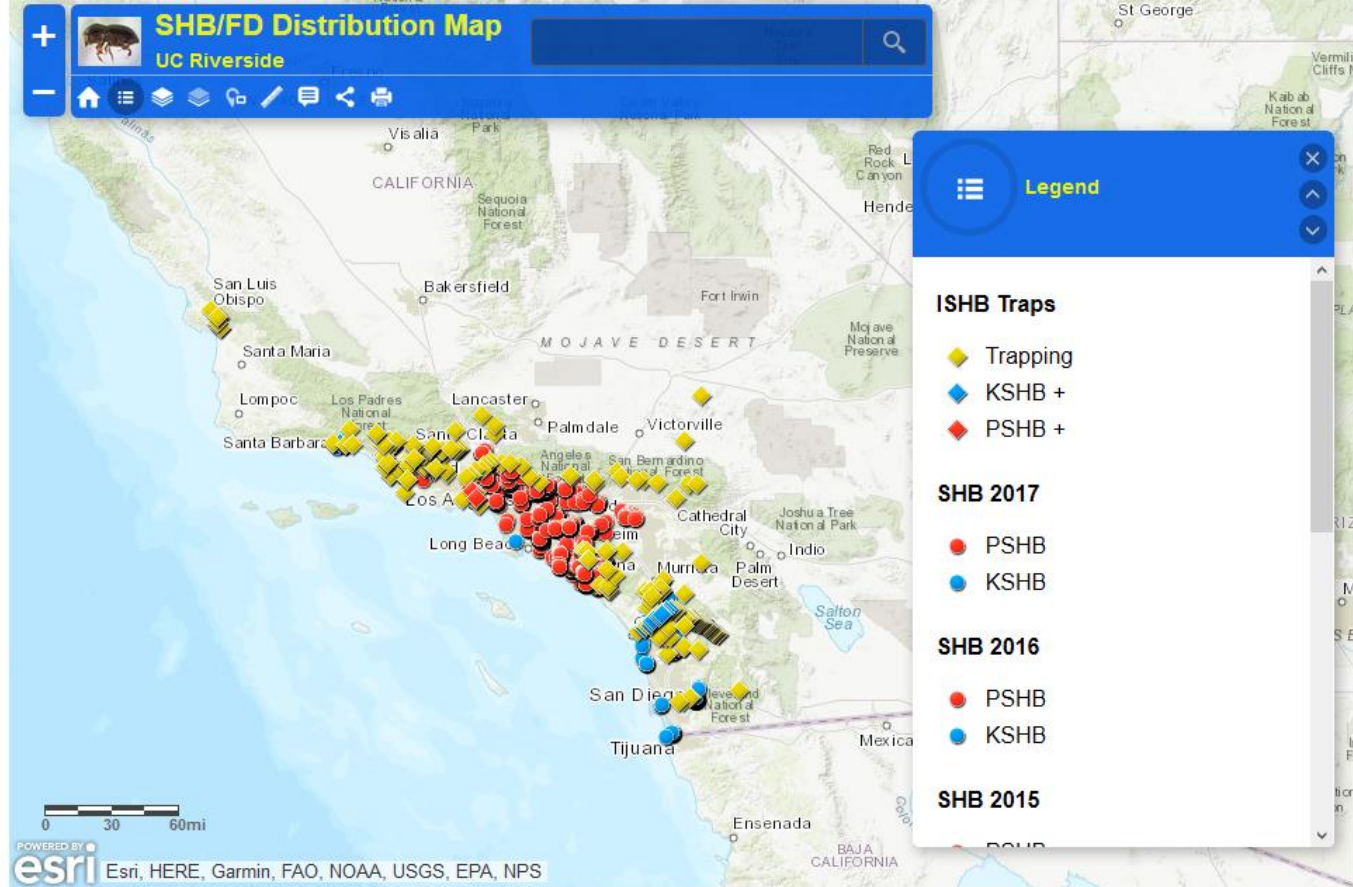
Range: Los Angeles, Orange,  
Riverside and San Bernardino  
Counties

# Situation in CA

First detected  
in 2003

Caused death of  
large number of  
Box Elder street trees  
in Long Beach in 2010

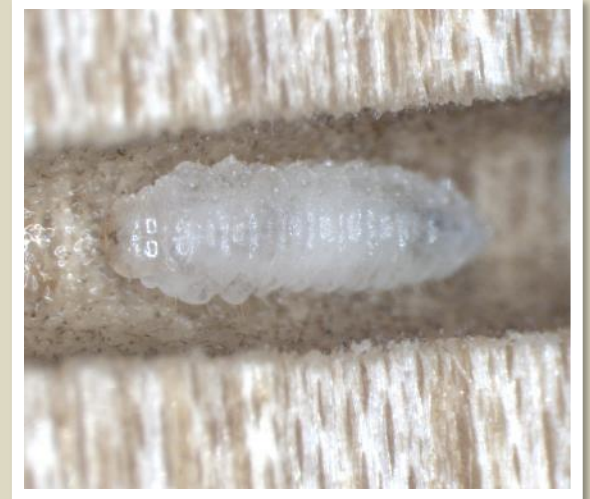
Problem not recognized until 2012 when we found it on a  
backyard avocado tree





Photos: Richard Stouthamer

# PSHB Life Cycle and Reproduction



- Majority of life cycle spent in gallery
- Brothers and sisters can mate in galleries - females are already mated when they leave
- Beetle colony stays in one host until the tree is killed

# Fusarium dieback caused by fungal pathogens



# Branch Dieback and Tree Wilt



Feb 2014



May 2015

# Branch Dieback and Tree Wilt



Box Elder



Sycamore

# Common symptoms of fusarium dieback on avocado





# Coast Live Oak (*Quercus agrifolia*)



# Top 3 Infested Species at OC Parks

## California sycamore

53.52% of OCP infestation



## London plane

12.73% of OCP infestation



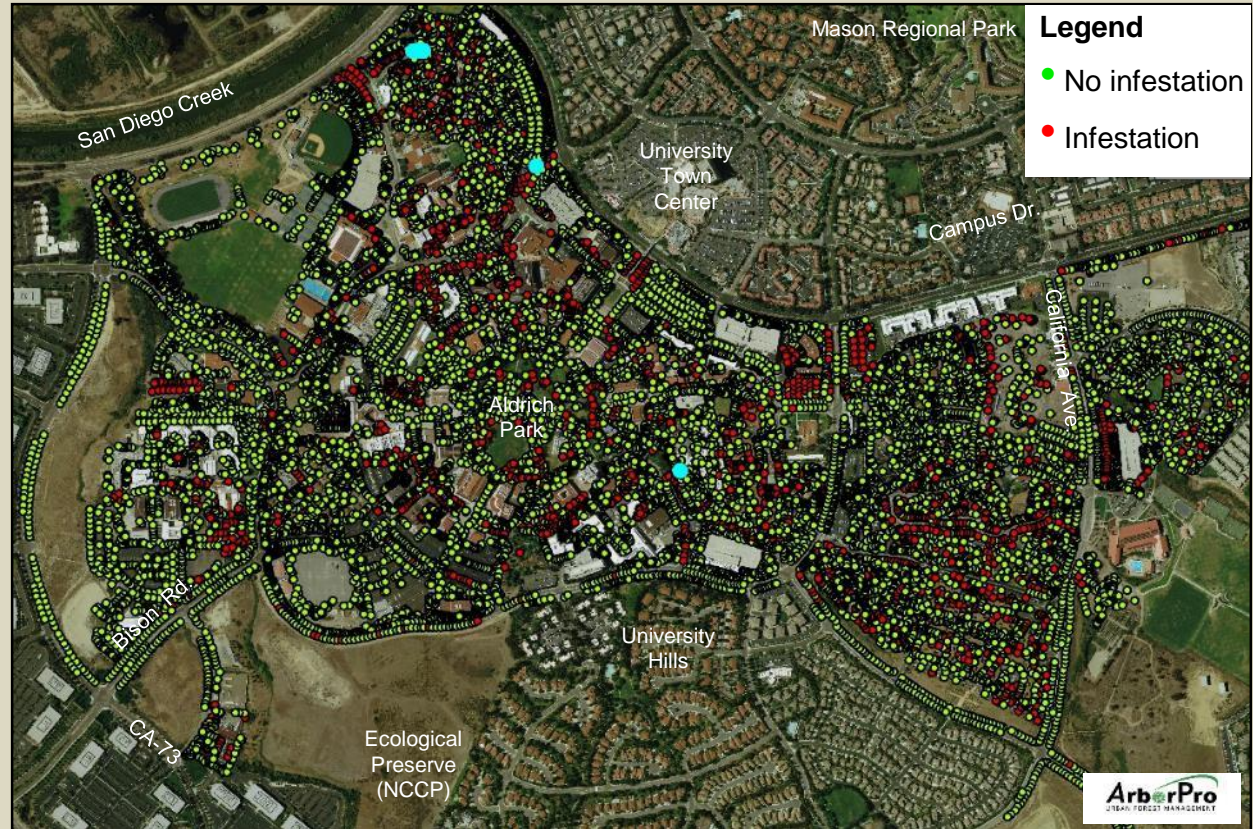
## White alder

9.66% of OCP infestation



# Status of UCI Infestation

- 2,500+ trees attacked
- 75 species attacked
  - Reproductive host species
  - Non-host species
- 523 trees removed (as of March 2016)



UCI

# 2015 Tijuana River Wetland San Diego County

## A Watershed Invasion

- 140,000 Willows attacked
- Symptoms expressed quickly
- Endangered species habitat
- Increased risk of
  - Flooding
  - Fire







# Ambrosia Beetles are difficult to control

- Sibling mating before females disperse
- Generally only short time outside the tree
- Attract Sex pheromones-  
No
- Aggregation pheromone –  
No
- Host attractants – Yes
  - Querciverol



## Polyphagous Shot-Hole Borer Host Range (Oct 2016) – NOT A “DO NOT PLANT” LIST!!!

1. **Box Elder (*Acer negundo*)\***
2. **Big leaf maple (*Acer macrophyllum*)\***
3. Evergreen maple (*Acer paxii*)
4. Trident maple (*Acer buergerianum*)
5. Japanese maple (*Acer palmatum*)
6. Castor bean (*Ricinus communis*)
7. **California sycamore (*Platanus racemosa*)\***
8. Mexican sycamore (*Platanus Mexicana*)
9. **Red willow (*Salix laevigata*)\***
10. **Arroyo willow (*Salix lasolepsis*)\***
11. Avocado (*Persea Americana*)
12. Mimosa (*Albizia julibrissin*)
13. English oak (*Quercus robur*)
14. **Coast Live oak (*Quercus agrifolia*)\***
15. London plane (*Platanus x acerifolia*)
16. **Cottonwood (*Populus fremontii*)\***
17. **Black cottonwood (*Populus trichocarpa*)\***
18. **White alder (*Alnus rhombifolia*)\***
19. Titoki (*Alectryon excelsus*)
20. **Engelmann oak (*Quercus engelmannii*)\***
21. Cork oak (*Quercus suber*)
22. **Valley oak (*Quercus lobata*)\***
23. Coral tree (*Erythrina corallodendron*)
24. **Blue palo verde (*Parkinsonia floridum*)\***
25. **Palo verde (*Parkinsonia aculeata*)\***
26. Moreton bay chestnut (*Castanospermum australe*)
27. Brea (*Cercidium sonora*)
28. **Mesquite (*Prosopis articulata*)\***
29. Weeping willow (*Salix babylonica*)
30. Chinese holly (*Ilex cornuta*)
31. Camellia (*Camellia semiserrata*)
32. Acacia (*Acacia* spp.)
33. Liquidambar (*Liquidambar styraciflua*)
34. Red flowering gum (*Eucalyptus ficifolia*)
35. Japanese wisteria (*Wisteria floribunda*)
36. **Goodding’s black willow (*Salix gooddingii*)\***
37. Tree of heaven (*Ailanthus altissima*)
38. Kurrajong (*Brachychiton populneus*)
39. Black mission fig (*Ficus carica*)
40. Japanese beech (*Fagus crenata*)
41. Shiny xylosma (*Xylosma congestum*)
42. **Mule fat (*Baccharis salicifolia*)\***
43. **Black poplar (*Populus nigra*)\***
44. Carrotwood (*Cupaniopsis anacardioides*)
45. **California buckeye (*Aesculus californica*)\***
46. **Canyon live oak (*Quercus chrysolepsis*)\***
47. Kentia palm (*Howea forsteriana*)
48. King Palm (*Archontophoenix cunninghamiana*)
49. Tamarix (*Tamarix ramosissima*)

### Kuroshio Shot-Hole Borer Host Range

1. Avocado (*Persea Americana*)
2. California sycamore (*Platanus racemosa*)\*
3. Coast live oak (*Quercus agrifolia*)
4. Cork oak (*Quercus suber*)
5. Draft coral tree (*Erythrina humeana*)
6. Black poplar (*Populus nigra*)\*
7. Black locust (*Robinia pseudoacacia*)
8. Red willow (*Salix laevigata*)\*
9. Arroyo willow (*Salix lasolepsis*)\*
10. Cottonwood (*Populus fremontii*)\*
11. Mimosa (*Albizia julibrissin*)
12. Castor bean (*Ricinus communis*)
13. Black willow (*Salix nigra*)\*
14. Strawberry snowball tree (*Dombeya cacuminum*)
15. Mule fat (*Baccharis salicifolia*)\*

\*7 Native species to California

\*19 Native species to California

Source: [www.eskalenlab.ucr.edu](http://www.eskalenlab.ucr.edu)



## Field Monitoring: entry/exit holes

Number of entry/exit holes **1) trunk** and **2) branches** recorded separately



## Field Monitoring – Visual Survey Top 3 Infested Species at OC Parks

California sycamore  
53.52% of OCP  
infestation



London plane  
12.73% of OCP  
infestation



White alder  
9.66% of OCP infestation




Photos | Monica Dimson, UC Cooperative Extension

http://ucanr.edu/sites/pshb/

University of California, Agriculture and Natural Resources




**Invasive Shot Hole Borers**

SHARE EMAIL PRINT SITE MAP Enter Search Terms



Home Pest Overview Distribution Map Diagnosis and Management Handouts and Resources Monitoring and Research Contacts In the News

### What are the Polyphagous and Kuroshio Shot Hole Borers?



The Polyphagous Shot Hole Borer (PSHB) is an invasive wood-boring beetle that attacks dozens of tree species in Southern California, including commercial avocado groves, common landscape trees, and native species in urban and wildland environments.

PSHB spreads a disease called Fusarium Dieback (FD), which is caused by pathogenic fungi. Trees that are FD-susceptible may experience branch dieback, canopy loss, and, in some cases, tree mortality.

Like PSHB, Kuroshio Shot Hole Borer (KSHB) is an exotic *Euwallacea* species that also vectors Fusarium Dieback. Both beetles are present in Southern California but are concentrated in different regions. **See their known distribution [here](#).**

**Get PSHB Updates**

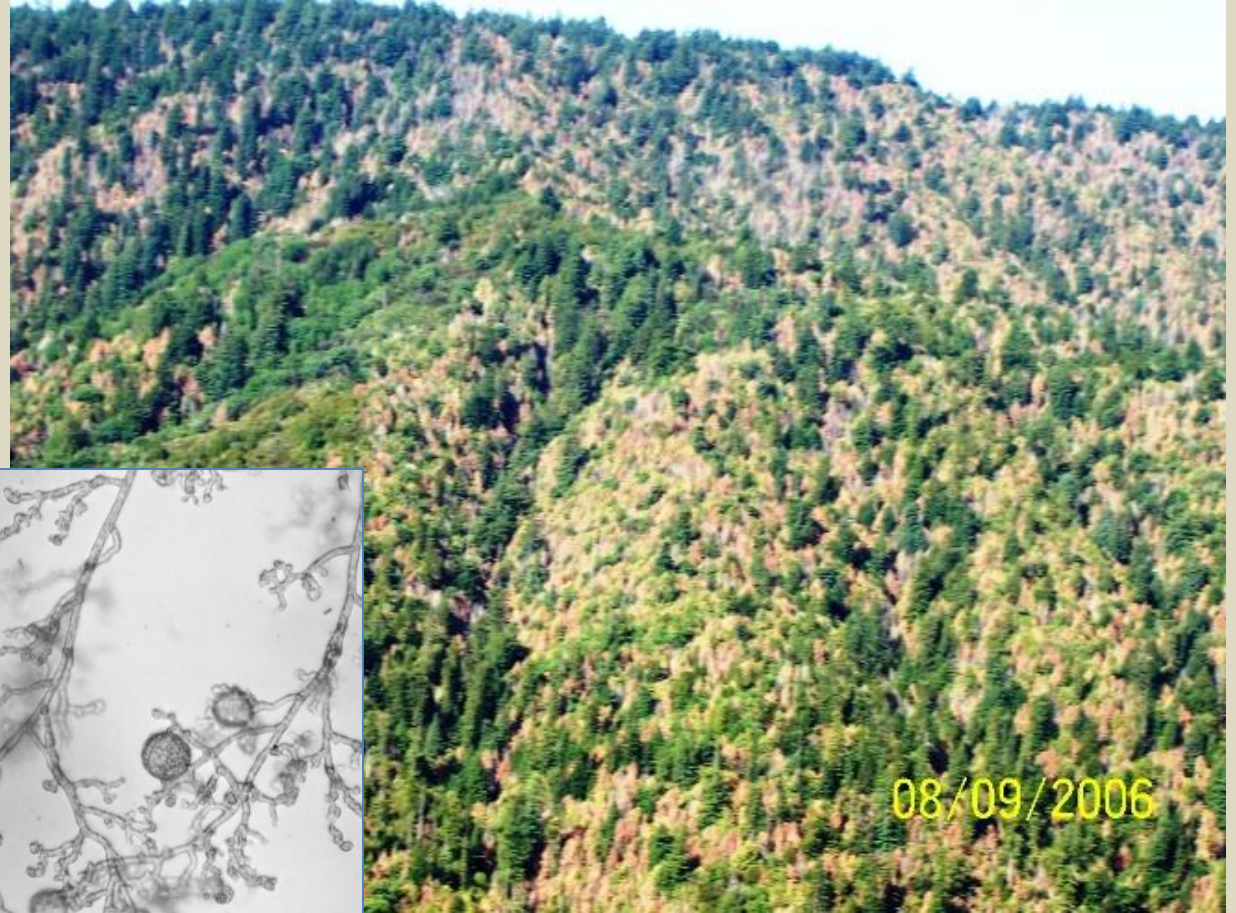
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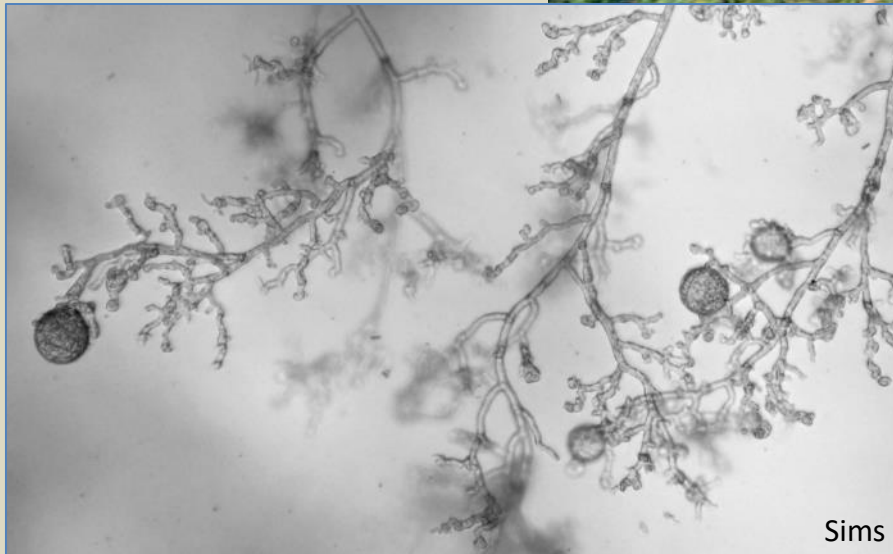
**Keep Current**

**Insects, Disease Ravage Trees in Southland**

# The old and the new: Sudden Oak Death and Friends

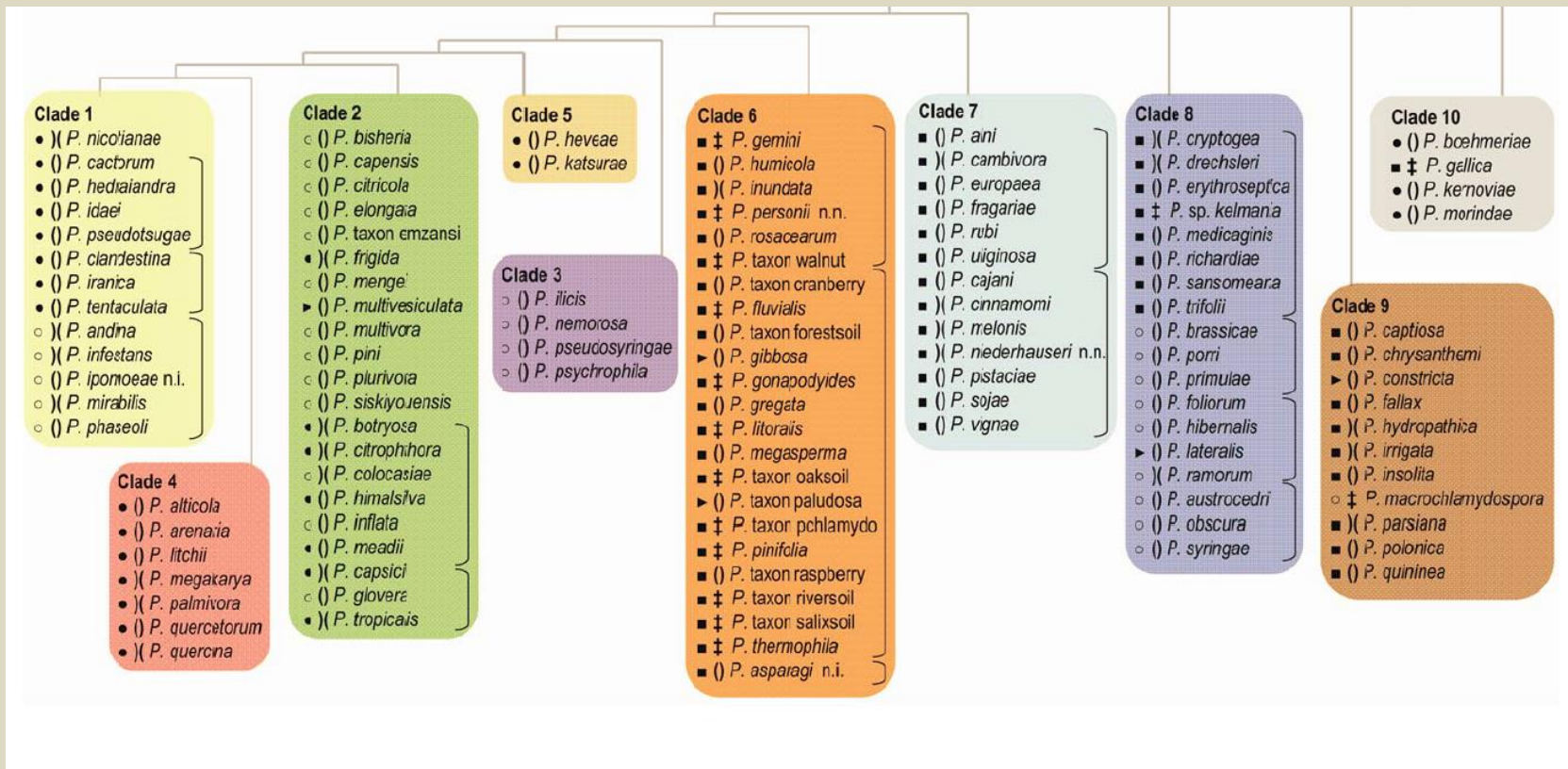


Janet Klien



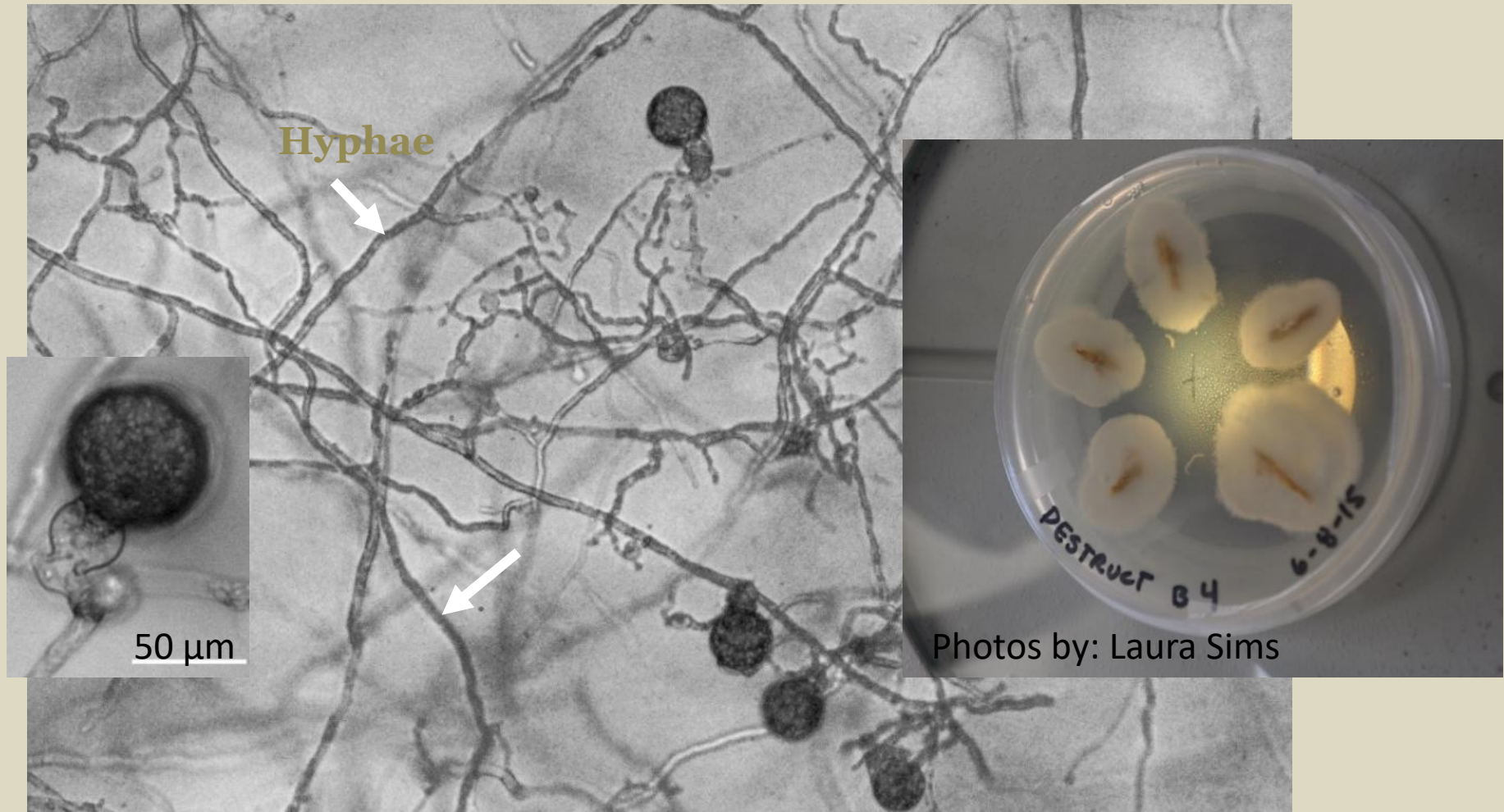
Sims

# Around the world ~ 120 *Phytophthora* species described



# What does *Phytophthora* look like?

Microscopic fungal-like organism that produces spores and hyphae (unrelated to true Fungi)



# Water mold -*Phytophthora* needs water to complete its lifecycle





Photo:Chastagner & Benson, The Christmas Tree: Traditions,  
Production, and Diseases

Root infecting *Phytophthora* can move with  
irrigation runoff



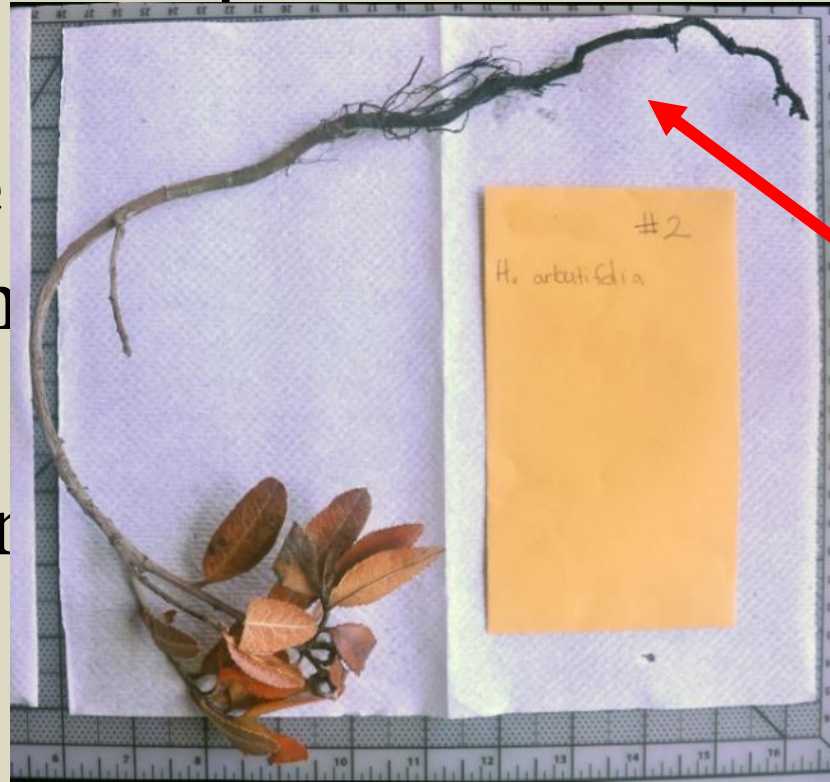
# Symptoms of Phytophthora canker and root disease



# *Phytophthoras* interruption to plant root function

-When roots are damaged from disease causing agent one or more of these functions is interrupted:

- Anchorage
- Absorption
- Storage
- Conduction



Non-functional root system resulting in disease and ultimately death

Photo by: Laura Sims

Drought tolerant native plant may work off of reserves long after roots used for absorption are gone

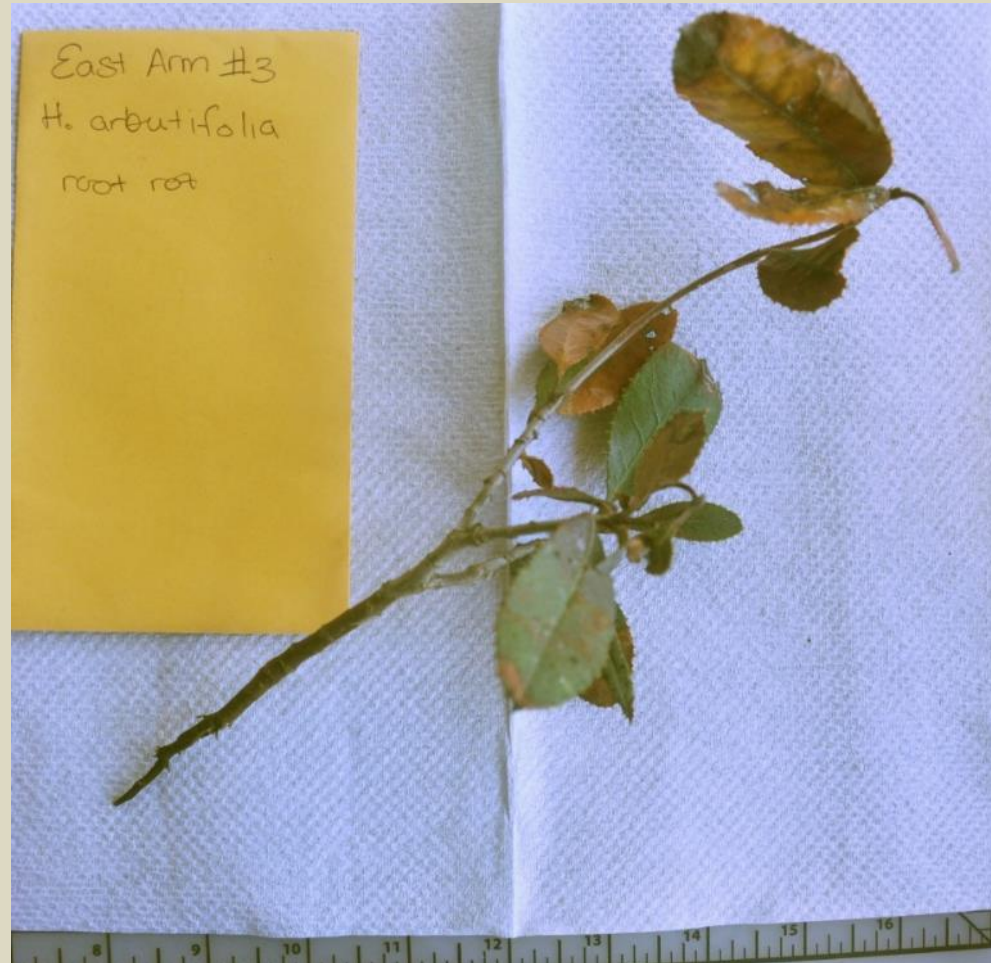
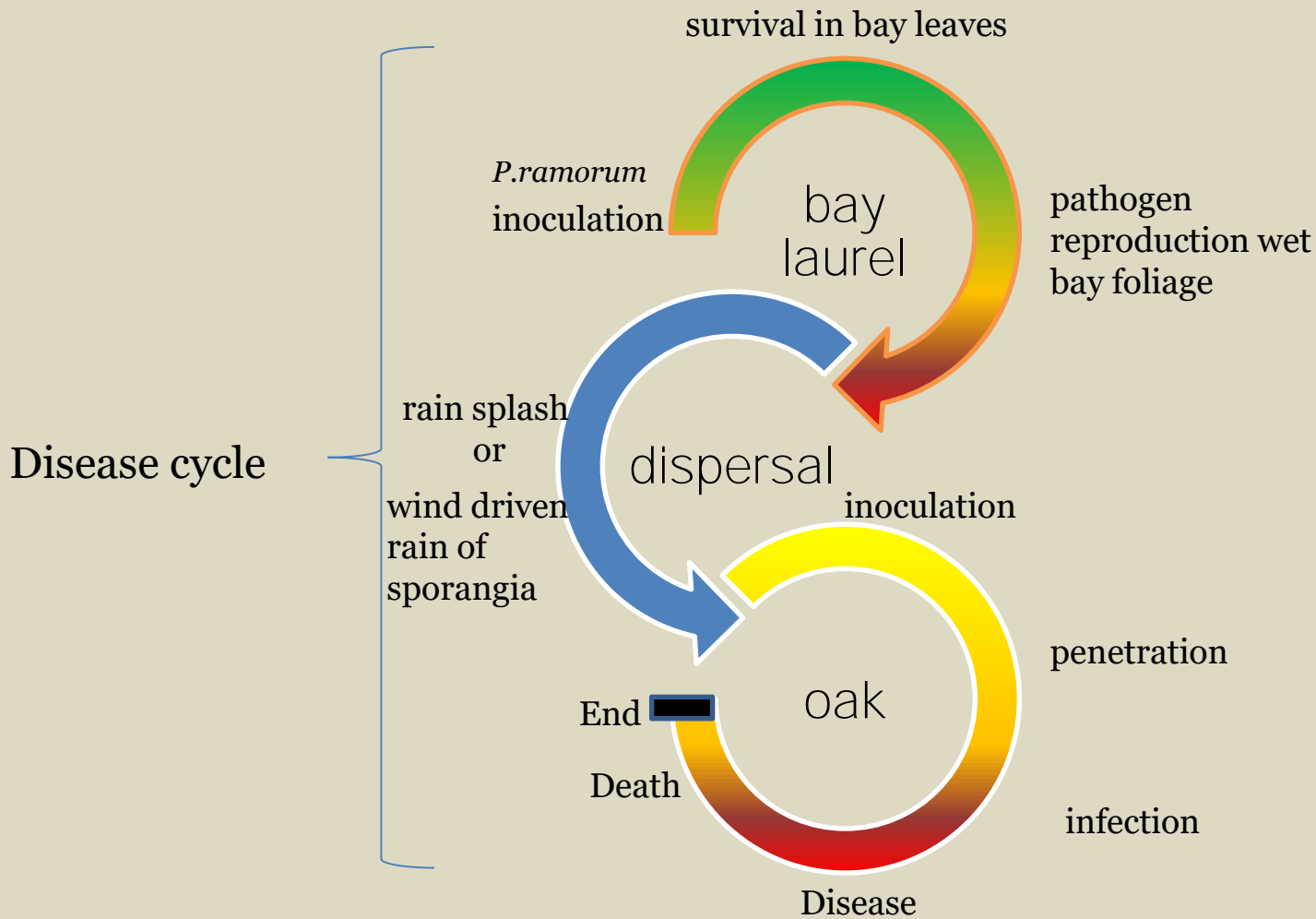


Photo by: Laura Sims

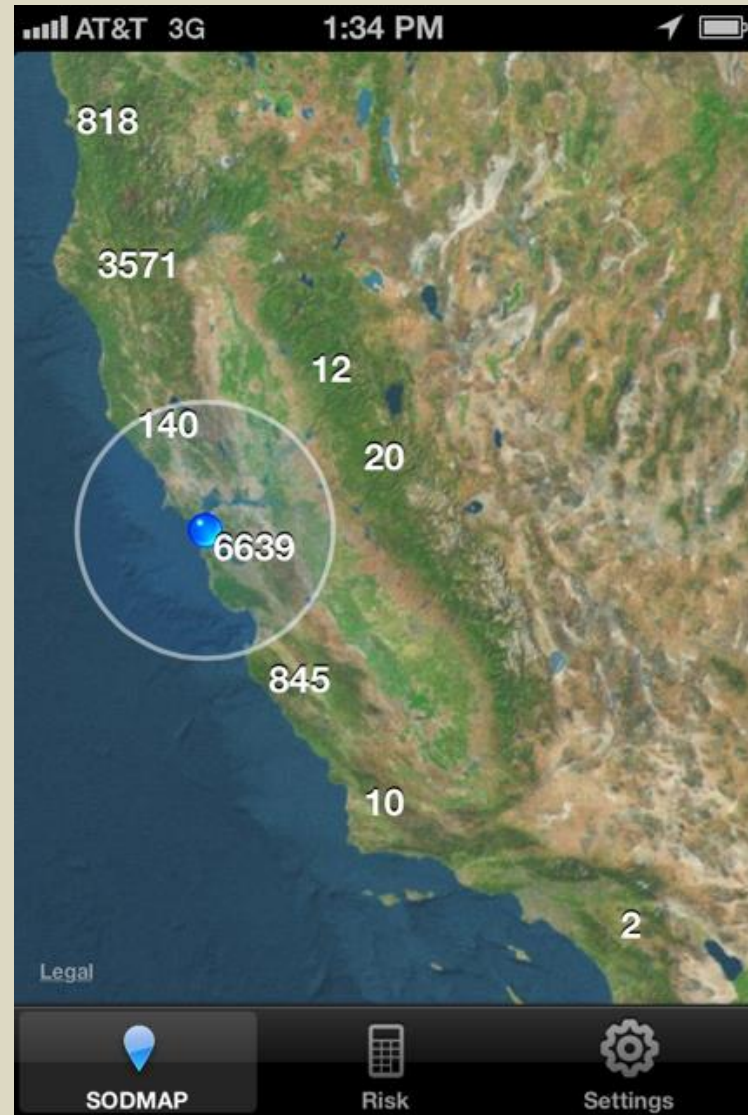
# Sudden Oak Death Disease cycle in the oak-bay system



# SODmap Mobile:

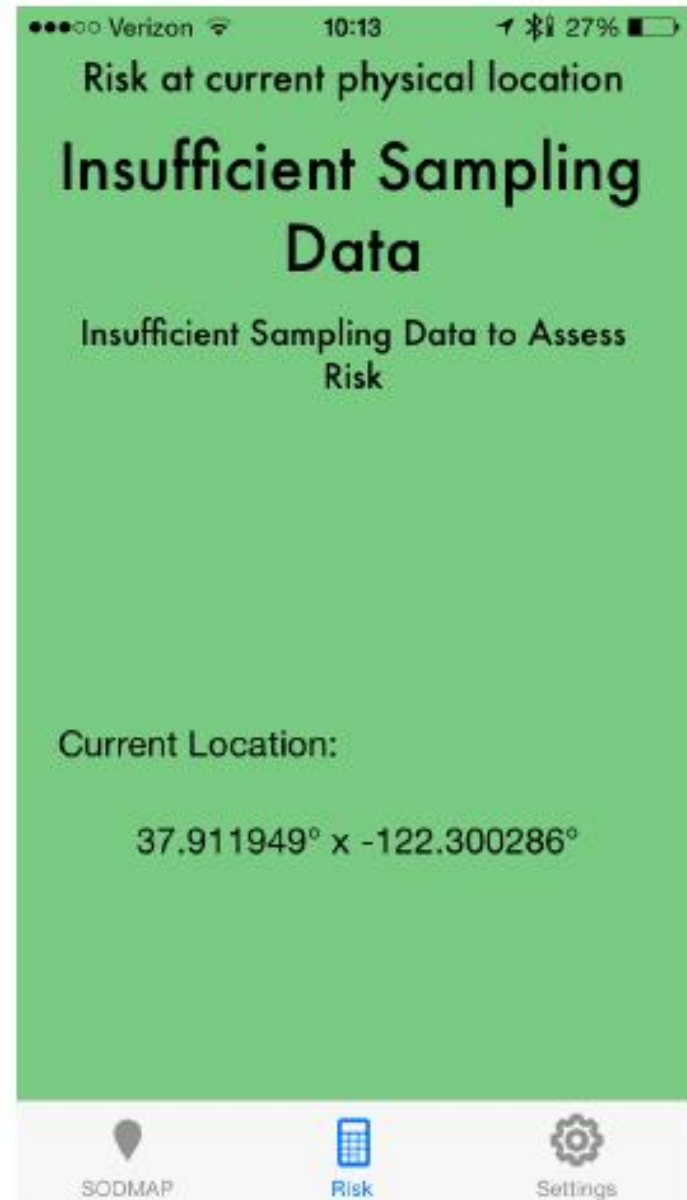
SODMAP Mobile

U.C. Berkeley  
Forest Pathology  
and Mycology  
Laboratory

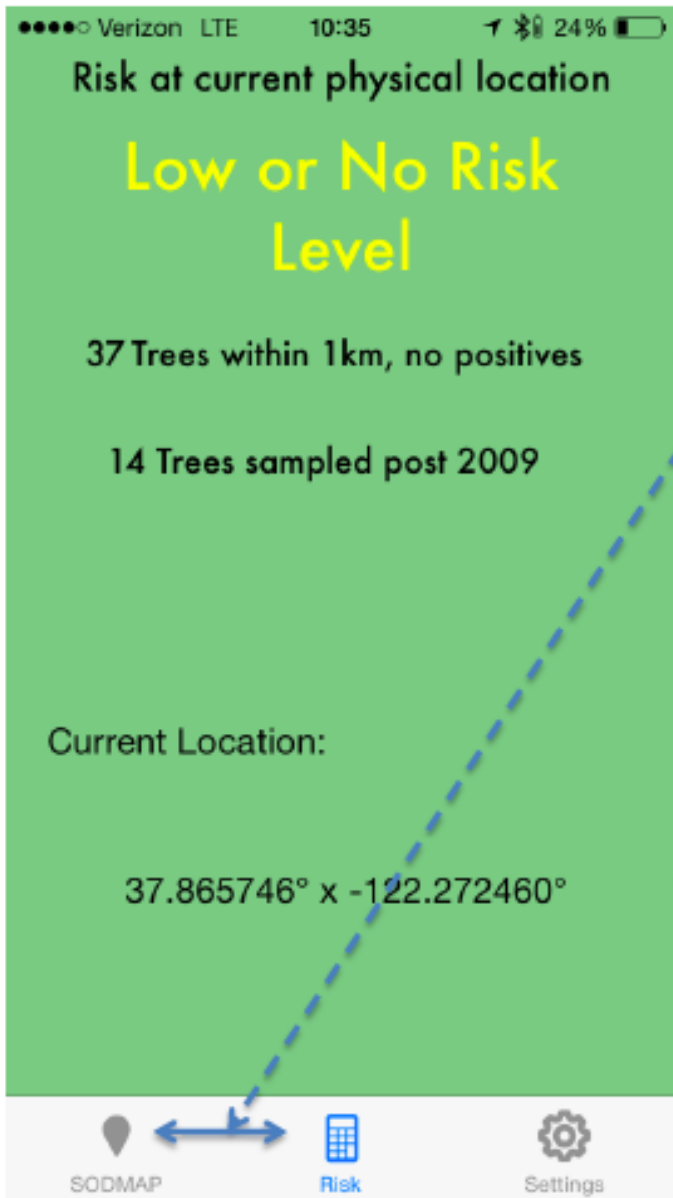




Tap on risk icon



Risk where you are physically standing



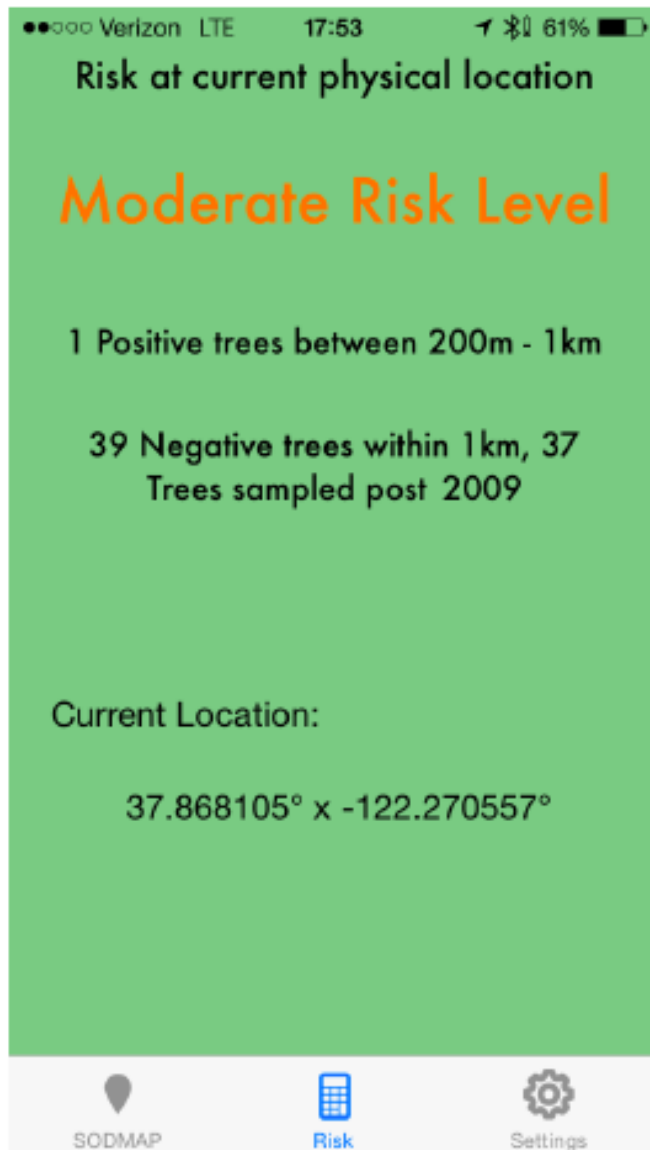
When assessing risk at a second location, remember to tap SODMAP button and then Risk button, in order to reset, otherwise you may get same warning as in the previous location

A two-digit number in this line gives you more confidence

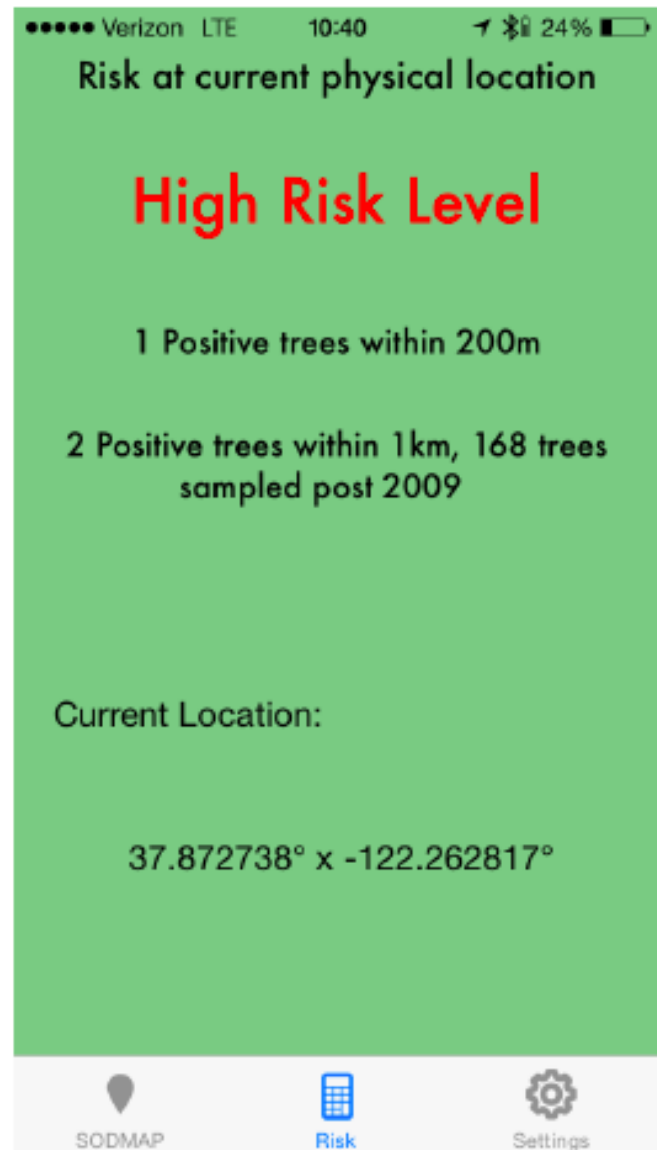
Number > 4 in this line gives you more confidence

Precise location and coordinates of user: You can record if needed

Stay alert but no need to do anything



May want to do something



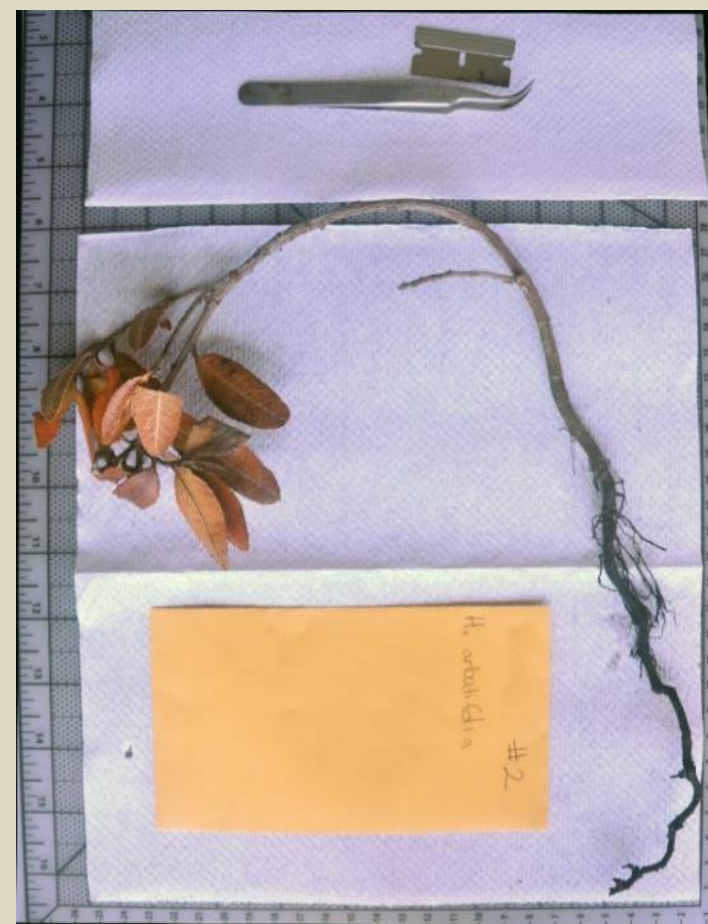
Urgent to do something if you have  
Oaks and bays growing together



# What to do and when to act

- Insufficient data or low risk
  - Keep monitoring your bay trees for infection, by participating in one of the many SOD blitzes in the Spring of each year. For info and details go to [www.sodblitz.org](http://www.sodblitz.org)
- Moderate or high risk
  - Do most of the significant yard work (e.g. pruning, grading, cutting dead trees) in the late summer or fall
  - Selectively remove “key” bay laurel trees in Summer and Fall
  - Apply a preventive phosphonate treatment to oaks at risk in the late Fall (after Halloween and before Xmas)

The issue: Phytophthora diseases are one of the most important problems faced by landscape managers in both urban and wildland areas



# *Phytophthora tentaculata* in California since at least 2012



Photo by: S. Rooney-Latham



Photo: Phytosphere research

Pay attention to the material you are working with. Be alert for disease symptoms on buy-ins. Make sure materials brought in are high quality. Test for pathogens, hold for several weeks prior to introduction into the the landscape.



Photos by: Christa Conforti

# Don't use dirty containers or reuse soil/ potting materials without treatment

Do-

- Soil Pasteurization
- Clean and sanitize containers

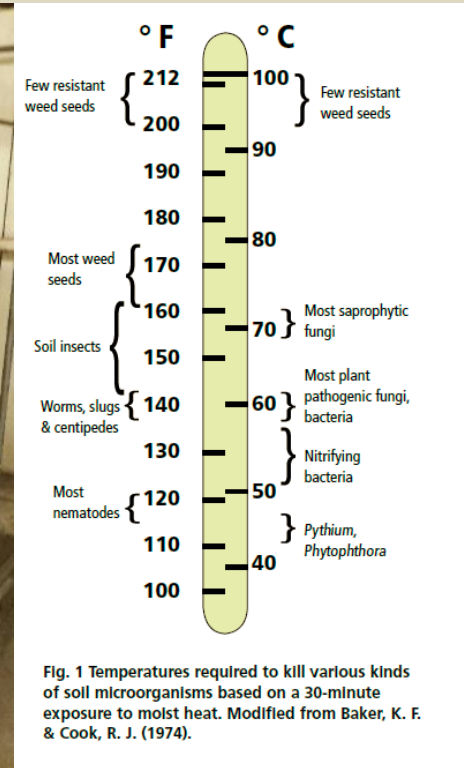


Fig. 1 Temperatures required to kill various kinds of soil microorganisms based on a 30-minute exposure to moist heat. Modified from Baker, K. F. & Cook, R. J. (1974).

Photos by: Lew Stringer

# Don't keep or use sick plants

Do be on the look out for plant disease symptoms



Photos by: Laura Sims

# Don't use dirty containers or reuse soil/ potting materials without treatment

Do-

- Soil Pasteurization
- Clean and sanitize containers

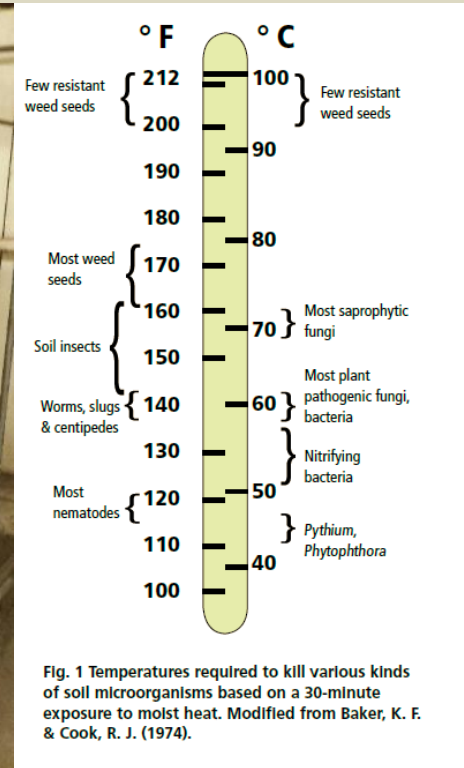


Fig. 1 Temperatures required to kill various kinds of soil microorganisms based on a 30-minute exposure to moist heat. Modified from Baker, K. F. & Cook, R. J. (1974).

Photos by: Lew Stringer

After planting, be alert for disease



Photos by: Laura Sims



# Outline

When things go wrong *pests, pests, pests!*

Tree parts *and what can be eaten*

Some old pests *and their management*

Some new pests *upcoming attractions*

**UC Resources and Discussion**



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

### Announcements

- 2011 Highlights: [Annual Report](#)
- UC IPM manual revised: [Integrated Pest Management for Citrus, 3rd edition](#)

### What's New

- Green Bulletin Newsletter: [February 2012 issue](#)
- Revised Pest Notes: [Cottony Cushion Scale, Mushrooms and Other Nuisance Fungi in Lawns](#)
- [More...](#)

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## Home, Garden, Turf & Landscape Pests



## Agricultural Pests



## Natural Environment Pests



## Exotic & Invasive Pests



[UC IPM Home](#) > [Homes, Gardens, Landscapes, and Turf](#) > Trees, Shrubs and Woody Ornamentals

## How to Manage Pests

### Pests in Gardens and Landscapes—Ornamental Trees and Shrubs

Search trees and shrubs:

The table below lists common, scientific, and family names for ornamental trees and shrubs included in this Web site. Click on a name to link to information about pests commonly found on that plant.

Click on a table heading to sort the column<sup>1</sup>. Legend: ▲ = Ascending, ▼ = Descending, ◆ = Unsorted

#### Common name index—see also [cultural tips](#)

[A](#) | [B](#) | [C](#) | [D](#) | [E](#) | [F](#) | [G](#) | [H](#) | [I](#) | [J](#) | [K](#) | [L](#) | [M](#) | [N](#) | [O](#) | [P-Q](#) | [R](#) | [S](#) | [T](#) | [U-Z](#) |

Common name	Scientific name	Family
<a href="#">Abelia</a>	<i>Abelia</i> spp.	Caprifoliaceae (Honeysuckle family)
<a href="#">Abutilon</a>	<i>Abutilon</i> spp.	Malvaceae (Hibiscus family)
<a href="#">Acacia</a>	<i>Acacia</i> spp.	Fabaceae (Pea family)
<a href="#">African fern pine</a>	<i>Podocarpus</i> spp.	Podocarpaceae (Podocarpus family)
<a href="#">Agave</a>	<i>Agave</i> spp.	Agavaceae (Agave family)
<a href="#">Albizia</a>	<i>Albizia</i> spp.	Fabaceae (Pea family)
<a href="#">Alder</a>	<i>Alnus</i> spp.	Betulaceae (Birch family)
<a href="#">Algerian ivy</a>	<i>Hedera</i> spp.	Araliaceae (Ginseng family)
<a href="#">Andromeda</a>	<i>Pieris</i> spp.	Ericaceae (Heath family)
<a href="#">Angelica</a>	<i>Fatsia japonica</i> = <i>Aralia sieboldii</i>	Araliaceae (Ginseng family)
<a href="#">Aralia</a>	<i>Fatsia japonica</i> = <i>Aralia sieboldii</i>	Araliaceae (Ginseng family)
<a href="#">Araucaria</a>	<i>Araucaria</i> spp.	Araucariaceae (Araucaria family)
<a href="#">Arborvitae</a>	<i>Platycladus orientalis</i>	Cupressaceae (Cypress family)
<a href="#">Arborvitae</a>	<i>Thuja occidentalis</i>	Cupressaceae (Cypress family)
<a href="#">Artemisia</a>	<i>Artemisia</i> spp.	Asteraceae (Sunflower family)

#### HOME

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[Home & landscape pests](#)

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[Natural environment pests](#)

[Exotic & invasive pests](#)

[Weed gallery](#)

[Natural enemies gallery](#)

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[Pesticide information](#)

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## How to Manage Pests

### Pests in Gardens and Landscapes

[www.ipm.ucanr.edu](http://www.ipm.ucanr.edu) or [www.ipm.ucdavis.edu](http://www.ipm.ucdavis.edu)

[More trees and shrubs](#)

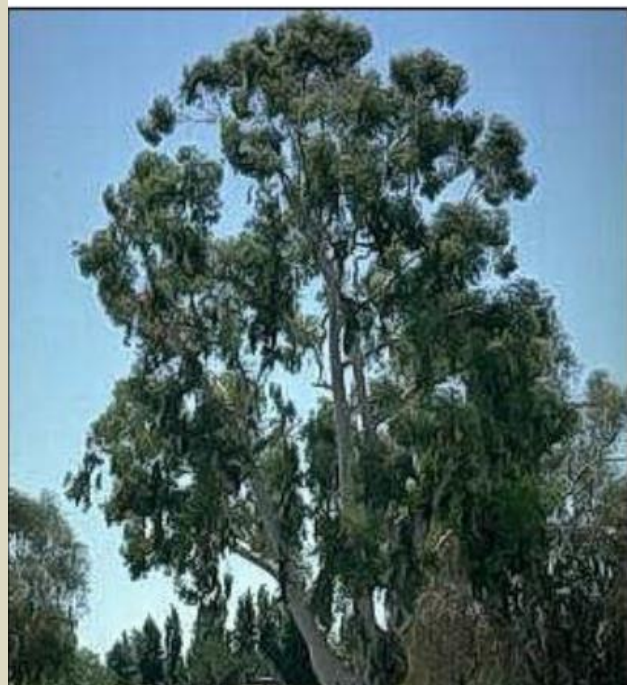
## Eucalyptus, Gum—*Eucalyptus* spp.

### Plant Identification

Eucalyptus species are evergreen trees or large shrubs. They are hardy, fast-growing, and widely adaptable.

### Optimum conditions for growth

Eucalyptus plants are widely adaptable to several climatic zones. They do best in full sun. They require little water once established; some species do better with some supplemental summer water.



### Pests and disorders of *Eucalyptus* spp.

#### Invertebrates

- [Eucalyptus redgum lerp psyllid](#)
- [Eucalyptus snout beetle](#)
- [Foliage-feeding caterpillars](#)
  - Omn

- [Psyllids](#)
  - Blue
- [Roundh](#)
  - [Euca](#)
  - [long](#)

#### Diseases

- [Armillar](#)
- [Collar, r](#)
- [rots](#)
- [Powder](#)

#### Environmental disorders

- [Frost](#)
- [Ligno-tubers](#)
- [Poor water management](#)

#### Weeds

**Pest Notes:**  
PDF & html

PDF files are about 1.00 MB. Large files may not display properly in Internet Explorer. To view PDF files, you must have Adobe Acrobat Reader installed on your computer.

## Eucalyptus Redgum Lerp Psyllid

PDF to Print \*

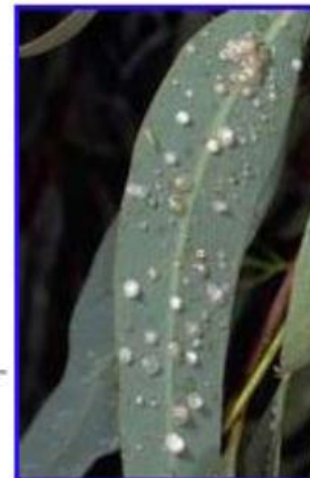
Published 1/06

In this Guideline:

- [Identification and life cycle](#)
- [Management](#)
- [Publication](#)
- [Glossary](#)



Leaves and



The redgum lerp psyllid (*Glycaspis brimblecombei*) was found in Los Angeles in 1998 and has spread throughout much of California. This insect from Australia also occurs in Arizona, Florida, Hawaii, and Mexico on a variety of eucalyptus species.

### IDENTIFICATION AND LIFE CYCLE

Psyllids are plant-juice sucking homopterans in the insect family Psyllidae. Redgum lerp psyllid nymphs (immatures) form a cover called a "lerp," which is a small white, hemispherical cap composed of solidified honeydew and wax. Lerp on leaves can be up to about 1/8 inch in diameter and 1/12 inch tall and resemble an armored scale (Fig. 1). Nymphs enlarge their lerp as they grow, or they move and form a new

# Prevention: Plant the resistant varieties!

Host	Pest	Resistant Alternatives
alder	flatheaded alder borer	black alder, page 181
ash	anthracnose	Moraine or Raywood, page 223, Table 5-6
birch	bronze birch borer	non-white-barked birch, e.g., <i>Betula alleghaniensis</i> , <i>B. lenta</i> , or <i>B. nigra</i> , page 180
box elder	boxelder bug	male box elder, page 153
ceanothus	ceanothus stem gall moth	Table 4-17, page 165
crape myrtle	powdery mildew	Table 5-9, page 236
cypress	cypress canker	Table 5-13, page 254

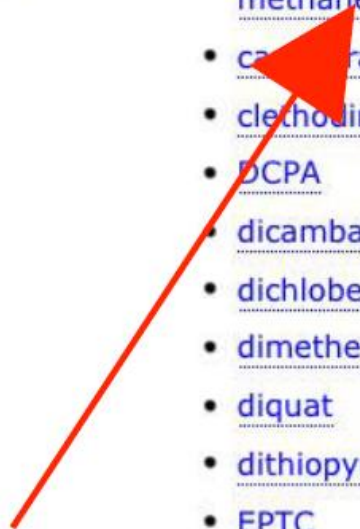
# Pesticides

## Insecticides/Miticides

- [abamectin](#)
- [acephate](#)
- [allethrin](#)
- [arsenic trioxide](#)
- [azadirachtin](#)
- [Bacillus thuringiensis](#)
- [Beauveria bassiana](#)
- [bifenthrin](#)
- [borate](#)
- [carbaryl](#)
- [clothianidin](#)
- [cryolite](#)
- [cyfluthrin](#)
- [dinotefuran](#)
- [disulfoton](#)
- [fipronil](#)
- [fluvalinate](#)
- [horticultural oil](#)
- [hydramethylnon](#)
- [imidacloprid](#)
- [inioha oil](#)

## Herbicides

- [2,4-D](#)
- [benefin](#)
- [bensulide](#)
- [bentazon](#)
- [bromoxynil](#)
- [cacodylic acid](#)
- [calcium acid methanearsenate](#)
- [carfentrazone](#)
- [clethodim](#)
- [DCPA](#)
- [dicamba](#)
- [dichlobenil](#)
- [dimethenamid-P](#)
- [diquat](#)
- [dithiopyr](#)
- [EPTC](#)
- [fluazifop](#)
- [fluroxypyr](#)
- [foramsulfuron](#)
- [glufosinate](#)



## How to Manage Pests

### Pesticide Information

| [About Pesticide Information](#) |

#### Active ingredient: Horticultural oil Pesticide type: fungicide, insecticide (oil)

Synonyms: fungicidal oil; horticultural oils; insecticidal oil; mineral oil; narrow range oil; oil; petroleum oil; summer oil; supreme oil

See [example products](#) below.

Potential Hazard <sup>1</sup> to				
Water quality <sup>2</sup> (aquatic wildlife)	Natural enemies (beneficials)	Honey bees <sup>3</sup>	People and Other Mammals	
			Acute <sup>4</sup>	Long Term <sup>5</sup>
<input type="checkbox"/> NKR	<input type="checkbox"/> L	<input type="checkbox"/> M	<input type="checkbox"/> VL	Not listed

#### Acute Toxicity to People and Other Mammals<sup>4</sup>

- Toxicity rating: **Not Acutely Toxic**

#### Long-Term Toxicity to People and Other Mammals<sup>5</sup>

# Pesticide Toxicity to Natural Enemies

Insecticide	Contact Toxicity (immediate killing)	Persistence of Toxic Residue*
<i>Bacillus thuringiensis</i>	No contact	No persistence
Oils/Soaps	Moderate contact	No persistence
Botanicals (pyrethrins/azadirachtin)	Moderate to High contact	Short persistence
Spinosad	Moderate contact	Intermediate persistence
Organophosphates/ Carbamates/Pyrethroids	High contact	Intermediate to long persistence
Imidacloprid: Foliar spray	Variable: Most natural enemies affected	Intermediate persistence
Imidacloprid: Soil applied or root/trunk-injected	Bees, predatory beetles and nectar-feeding parasites affected	Long persistence



\* **Persistence** is the length of time a pesticide remains toxic.  
**Intermediate** = toxic for weeks; **Long** = toxic for months

TABLE 2.1 Common terrestrial predatory bug families

**Auchenorhyncha, minute plant bug or flower bug**

Many are predators on aphids, mites, other insects, and even eggs. Adults are about 1 to 2 inches (2.5–5 mm) long, oval, black or purple with white markings, and have a triangular head. Females are necessary for a stage of their life cycle called oviposition. They are common in most areas of the United States.

**Coreidae subfamily of Lygaeidae, big-eyed bug or seed bug**

Feeds on both insects and seeds. Big-eyed bugs are small, somewhat flattened, usually brownish or reddish insects with a shield-like pattern. They have a small head and many prominent legs. They are most common in the southern United States.

**Hemiptera, damsel bug**

Prefer to eat mites, aphids, caterpillars, leafhoppers, and other insects. Damsel bugs are mostly yellowish-green or reddish-brown, slender insects with a triangular head and long antennae. Adults look like small dragonflies, up to 2 inches (5 cm) long. Nymphs sometimes look like ants. About 200 species worldwide.

**Heteroptera, stink bug**

Although most species are plant feeders (eg, corn stink bug), some are predators on insects and other insects. Many species are very common, especially in the southern United States. They are oval or shield-shaped, commonly brownish, and usually are 1/2 to 1 inch (12 mm) long.

**Phytocoridae, ambush bug**

Ambush bugs wait motionless on plants and grab passing prey. They, and weevils, are often larger than their prey. Some species, from 1/2 to 1 inch long or less, with broad, flattened bodies and variable, cryptic colors, often black and brown, yellow, or green. About 300 known species.

**Reduviidae, assassin bug**

All are predators. Some (eg, kissing bug, western blackbacking assassin) cause allergic reactions, most as only adults. Adults are blackish, reddish or brown, with a distinctive head, round body, and six legs. They are most common in the southern United States.

**Cimicid subfamily of Reduviidae, shield bug**

All are predators on various small insects. Adults have an elongated, shield-like body with long, thin antennae. Many species are very common, especially in the southern United States.

**Staphylinidae, rove beetle**

They feed on insects (especially caterpillars) and other insects. They are small, dark, and have a very long, thin body. They are most common in the southern United States.

Without these symptoms, the virus shows themselves. If you find any of the following signs, you may have a pest problem. Check symptoms carefully and take the following steps:

• **LENGTH** – If you find any of the following signs, you may have a pest problem. Check symptoms carefully and take the following steps:

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# Beneficial Predators

Encourage these natural enemies by avoiding pesticides that kill them; choosing plants that provide them with pollen, nectar, and shelter; and keeping ants out of pest-infested plants. Common predators that eat garden pests are pictured below with bars showing their length.



Convergent lady beetle adults (left) and most reddish lady beetle species prefer aphids. Their larvae (right) prefer aphids but sometimes eat whiteflies and other soft-bodied insects.



Lady beetle eggs are oblong, yellowish in their middle, usually orange, and can be eaten by ants or individually. Syrphid fly larvae eat mostly aphids but also soft-bodied insects, mealybugs, psyllids, and whiteflies.



Lacewing adults (left) eat nectar and pollen. Some species eat insects. Lacewing larvae (right) feed on mites, eggs, and especially aphids.



Soldier beetle eggs are mostly aphids. Their soil-dwelling larvae eat beetle and moth eggs and larvae.

## Common Garden Spiders

Protect spiders in your garden because they prey on insects and other pests. Spiders whose bites might require you to seek medical attention spend most of their time hidden. Most spiders seen in the open during the day aren't likely to bite you or won't cause lasting harm if they do bite you.

Spiders are arachnids, not insects. They have 8 legs and 2 body parts—an abdomen and a combined head and thorax. They lack wings and antennae. Spider families vary by body shape, web type, hunting or other behavior, and the arrangement and relative size of their eyes.

**Cellar spiders** have long, skinny legs and hang upside down in dark corners, often indoors, sometimes bouncing when disturbed. The marbled cellar spider, *Holocnemus pluchei*, is shown here.

**Cobweb spiders** hang upside down in irregularly spun, sticky webs waiting for prey. Most cobweb species are small and harmless, such as this *Theridion dikotum*.

**Western black widow**, *Latrodectus hesperus*, is the most well-known cobweb spider. The primary stage that harms people is the adult female (left), usually recognizable by a red hourglass on the underside of its abdomen and shown here hanging upside down in her web. The adult male (right) is lighter colored and smaller than the female.

# NATURAL ENEMIES HANDBOOK

The Illustrated Guide to Biological Pest Control

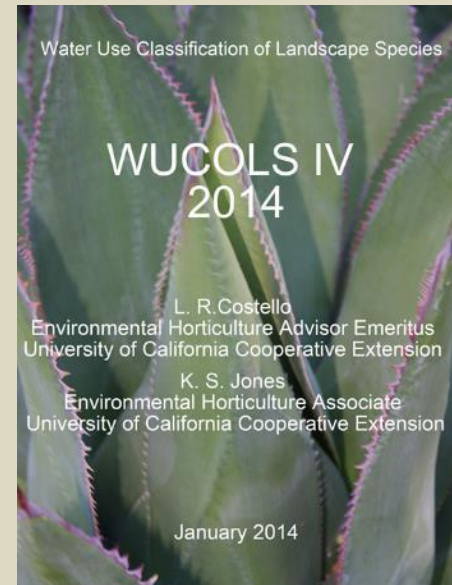
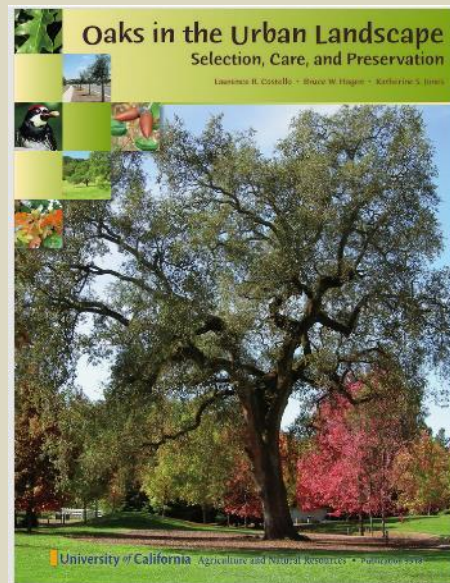
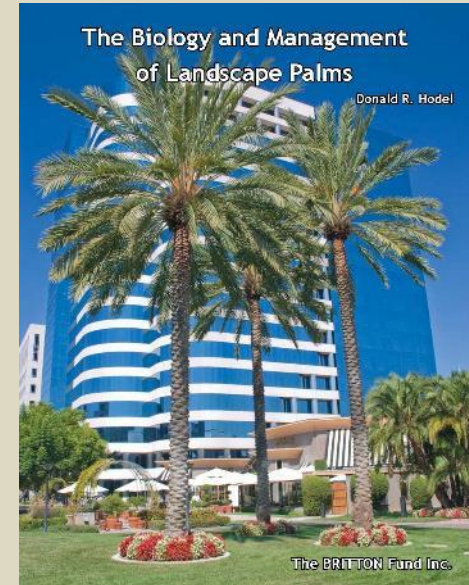
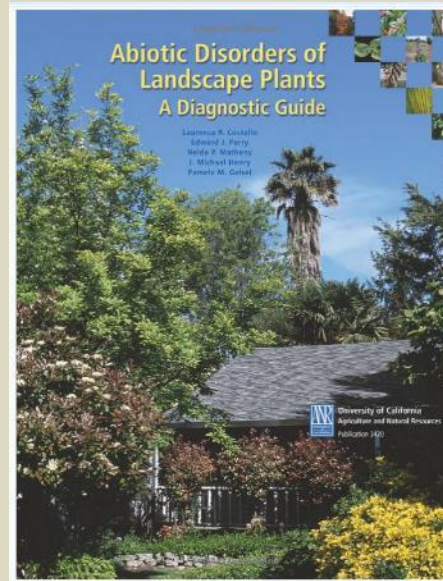
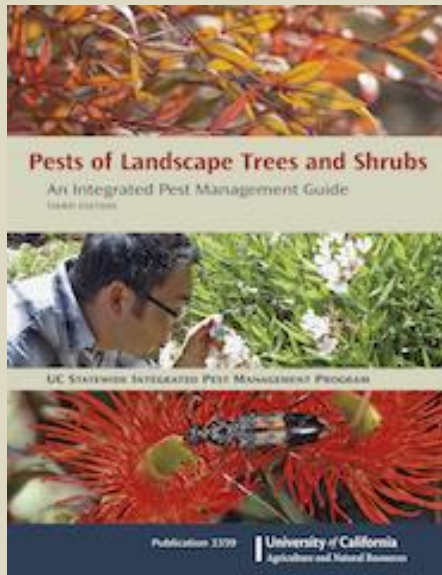
## Parasites of Insect Pests

A parasite is an organism that lives in or on a larger animal (host). Nearly all insects have parasites.

Caterpillar parasites include the Hyposoter of an egg in an armyworm (left). Pulling apart parasitoid of the wasp larva within (right).



# University of California Urban Forestry Books



Thank you!

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ilacan@ucanr.edu

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CE

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Agriculture and Natural Resources

Cooperative Extension