

Spring Applications for Landscape & Tree Care

Landscape IPM Workshop-Foster City, CA

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Pest Control vs. Pest Management

- Pest Control

- Applying pesticides when pests may or may not be present
 - Calendar routes

- Pest Management

- ONLY uses pesticides when pests are present*
- Consider it a Prescription treatment



Urban Tree Management

Proper land management (and Pest management) is an on-going process that requires informed and diligent stewardship.

- Ask questions
- Consult your peers



The mind is like a flower, it only works when it is open.

- What do you need to know:
- Species/Size/Location
- Local factors
- Health and condition (Foliage, structure, soil)
- History
- Secondary symptoms
- Reactionary pests



Did you catch it in time?

Urban Tree Management

Take a 'TRAC Course'

- ISA Standards/BMPs
- Tree Risk Assessment
 - Covers the bases



That was close...

Urban Tree Management

,

- ... Will this cause stress?
- Will the stress attract insects?
- Will conditions favor disease?



That was close...

How do you keep track
of all the data.

Take a Tree Risk
Assessment Course

Keep Records of your
findings

Take notes

Take Pictures



Spring... time to start or catch up


Which tree is going to be more resilient to pests...

Great time to take notes.

**Before and after pictures of what you can do
make a big impact with your client.**



- What do you need to know:



Basic Tree Risk Assessment Form

Client _____ Date _____ Time _____
 Address/Tree location _____ Tree no. _____ Sheet _____ of _____
 Tree species _____ dbh _____ Height _____ Crown spread dia. _____
 Assessor(s) _____ Tools used _____ Time frame _____

Target Assessment								
Target number	Target description	Target protection	Target zone			Occupancy rate 1 – rare 2 – occasional 3 – frequent 4 – constant	Practical to move target?	Restriction practical?
			Target within drip line	Target within 1 x Ht.	Target within 1.5 x Ht.			
1								
2								
3								
4								

Site Factors

History of failures _____ Topography Flat ☐ Slope ☐ _____ % Aspect _____
 Site changes None ☐ Grade change ☐ Site clearing ☐ Changed soil hydrology ☐ Root cuts ☐ Describe _____
 Soil conditions Limited volume ☐ Saturated ☐ Shallow ☐ Compacted ☐ Pavement over roots ☐ _____ % Describe _____
 Prevailing wind direction _____ Common weather Strong winds ☐ Ice ☐ Snow ☐ Heavy rain ☐ Describe _____

Tree Health and Species Profile

Vigor Low ☐ Normal ☐ High ☐ Foliage None (seasonal) ☐ None (dead) ☐ Normal _____ % Chlorotic _____ % Necrotic _____ %
 Pests/Biotic _____ Abiotic _____
 Species failure profile Branches ☐ Trunk ☐ Roots ☐ Describe _____

Load Factors

Wind exposure Protected ☐ Partial ☐ Full ☐ Wind funneling ☐ _____ Relative crown size Small ☐ Medium ☐ Large ☐
 Crown density Sparse ☐ Normal ☐ Dense ☐ Interior branches Few ☐ Normal ☐ Dense ☐ Vines/Mistletoe/Moss ☐ _____
 Recent or expected change in load factors _____

- What do you need to know:

Tree Defects and Conditions Affecting the Likelihood of Failure			
— Crown and Branches —			
Unbalanced crown <input type="checkbox"/> LCR _____ % Dead twigs/branches <input type="checkbox"/> _____ % overall Broken/Hangers Number _____ Max. dia. _____ Over-extended branches <input type="checkbox"/> Max. dia. _____ Pruning history Crown cleaned <input type="checkbox"/> Thinned <input type="checkbox"/> Raised <input type="checkbox"/> Reduced <input type="checkbox"/> Topped <input type="checkbox"/> Lion-tailed <input type="checkbox"/> Flush cuts <input type="checkbox"/> Other _____	Cracks <input type="checkbox"/> _____ Lightning damage <input type="checkbox"/> Codominant <input type="checkbox"/> _____ Included bark <input type="checkbox"/> Weak attachments <input type="checkbox"/> _____ Cavity/Nest hole _____ % circ. Previous branch failures <input type="checkbox"/> _____ Similar branches present <input type="checkbox"/> Dead/Missing bark <input type="checkbox"/> Cankers/Galls/Burls <input type="checkbox"/> Sapwood damage/decay <input type="checkbox"/> Conks <input type="checkbox"/> Heartwood decay <input type="checkbox"/> _____ Response growth _____	Condition(s) of concern _____ _____ Part Size _____ Fall Distance _____ Load on defect N/A <input type="checkbox"/> Minor <input type="checkbox"/> Moderate <input type="checkbox"/> Significant <input type="checkbox"/> Likelihood of failure Improbable <input type="checkbox"/> Possible <input type="checkbox"/> Probable <input type="checkbox"/> Imminent <input type="checkbox"/>	
— Trunk —			
Dead/Missing bark <input type="checkbox"/> Abnormal bark texture/color <input type="checkbox"/> Codominant stems <input type="checkbox"/> Included bark <input type="checkbox"/> Cracks <input type="checkbox"/> Sapwood damage/decay <input type="checkbox"/> Cankers/Galls/Burls <input type="checkbox"/> Sap ooze <input type="checkbox"/> Lightning damage <input type="checkbox"/> Heartwood decay <input type="checkbox"/> Conks/Mushrooms <input type="checkbox"/> Cavity/Nest hole _____ % circ. Depth _____ Poor taper <input type="checkbox"/> Lean _____ * Corrected? _____ Response growth _____ Condition(s) of concern _____ Part Size _____ Fall Distance _____ Load on defect N/A <input type="checkbox"/> Minor <input type="checkbox"/> Moderate <input type="checkbox"/> Significant <input type="checkbox"/> Likelihood of failure Improbable <input type="checkbox"/> Possible <input type="checkbox"/> Probable <input type="checkbox"/> Imminent <input type="checkbox"/>			
— Roots and Root Collar —			
Collar buried/Not visible <input type="checkbox"/> Depth _____ Stem girdling <input type="checkbox"/> Dead <input type="checkbox"/> Decay <input type="checkbox"/> Conks/Mushrooms <input type="checkbox"/> Ooze <input type="checkbox"/> Cavity <input type="checkbox"/> _____ % circ. Cracks <input type="checkbox"/> Cut/Damaged roots <input type="checkbox"/> Distance from trunk _____ Root plate lifting <input type="checkbox"/> Soil weakness <input type="checkbox"/> Response growth _____ Condition(s) of concern _____ Part Size _____ Fall Distance _____ Load on defect N/A <input type="checkbox"/> Minor <input type="checkbox"/> Moderate <input type="checkbox"/> Significant <input type="checkbox"/> Likelihood of failure Improbable <input type="checkbox"/> Possible <input type="checkbox"/> Probable <input type="checkbox"/> Imminent <input type="checkbox"/>			

Go see for yourself

Inspection tools:

- Diameter tape
 - Pocket knife
 - Sounding hammer
 - Soil probe
 - Hand trowel & hand rake
 - Small shovel
-
- Using these items will remind
 - you of questions to ask



Id that sucker!



How are we going to treat?

- Do you have everything you need to get started?



Sometimes it's 2 choices...?

OMRI



Steven Wayne Rotsch/Painet Inc

Or...



Disorders & Disease



Prune & treat or PHC, Prune, & Treat?

- **Do the plants have enough foliar material to pull treatments into canopy**
- **Is there enough vascular tissue to move corrective measures throughout the plant**
- **Will the toxicity of a pesticide prior to corrective measures harm plant even more?**

•



Every situation is different

Most issues in an urban area are the result of human interference.



Every situation is different

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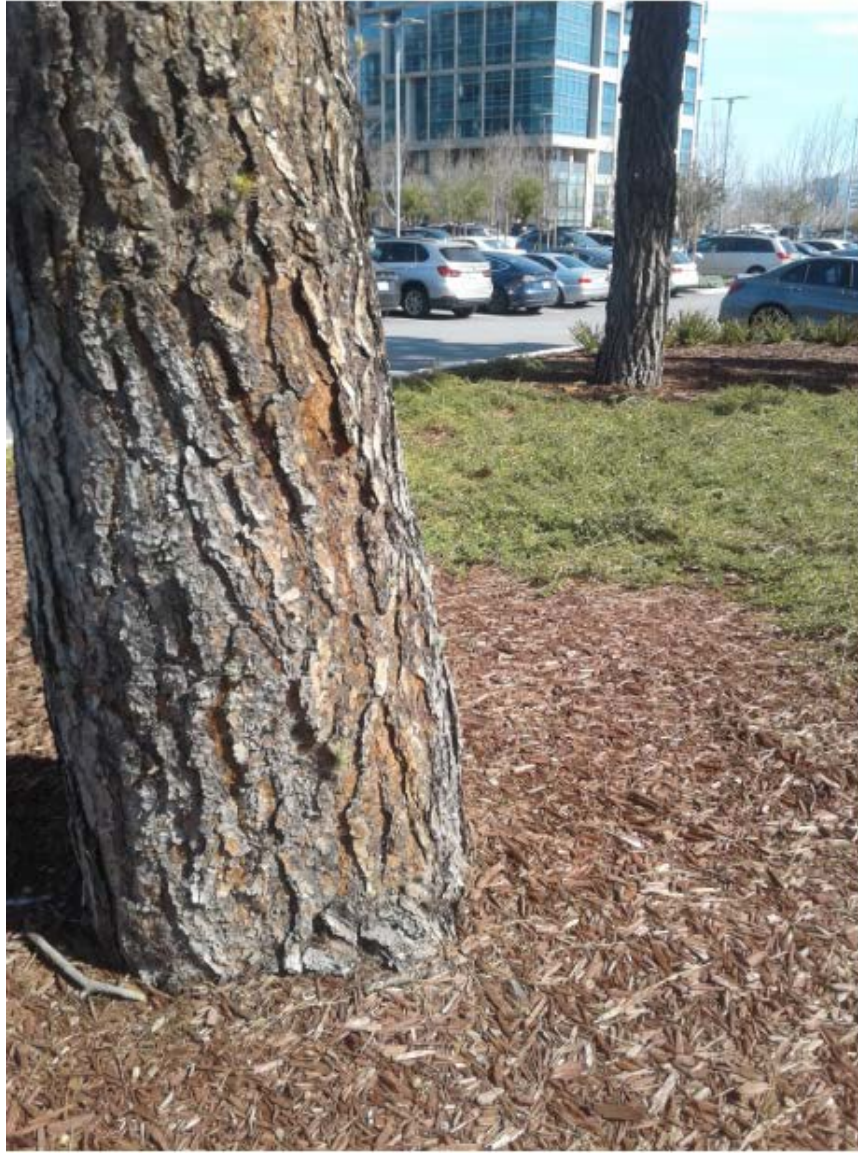
Every situation is different

Most issues in an urban area are the result of human interference.



Every situation is different

Most issues in an urban area are the result of human interference.



Fall rains will make this worse...

No fungicide can fix this...



... or this.

Doesn't have to be trees...



Every situation is different

Most issues in an urban area are the result of human interference.



What you do in one season may impact the next.

Fixing one problem but creating another.

Do you have enough man power
To monitor this?

Moisture:

- In the right place
- In the correct amount.
- At the right time

Remove before rot starts



Making recommendations...

What looks good in Spring may not be a 'good' idea in the long term.



What you do in one season may impact the next.

Crown rot..

Now this is a
structural issue!



Got this yet?

History

- Sudden Oak Death-*Phytophthora ramorum*

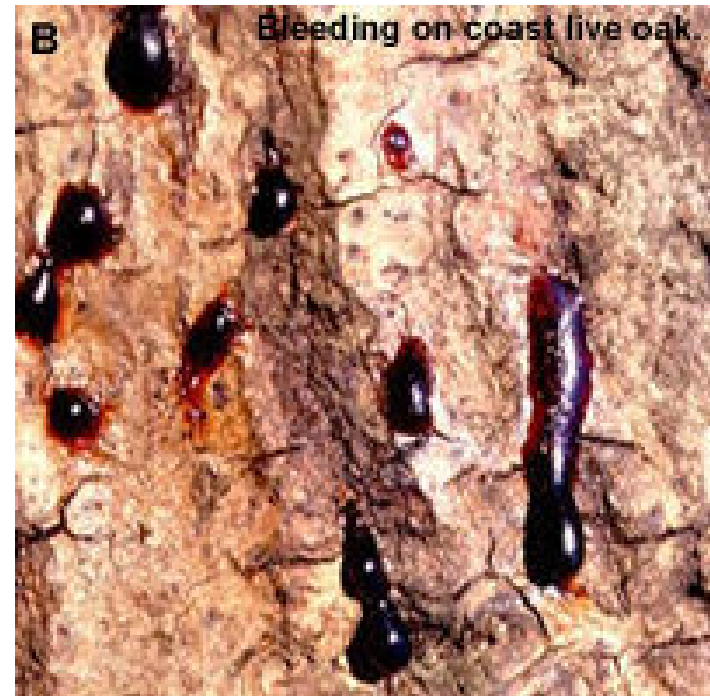


A range of crown symptoms in an infested forest.



In coast live oaks and Californian black oaks,

The first symptom is a burgundy-red to tar-black thick sap bleeding from the bark surface or bleeding cankers.



Proposed Disease Cycle for *Phytophthora ramorum* in Forests*

A. Sporulation* on infected leaves of foliar host²

B. Twig infections²

1

1

1

3

4

5

6

California Bay Laurel
(foliar host)

Fallen leaves

Understory
Trees & Shrubs

Tanoak
(bole canker and
foliar host)

C. Dying crown of a
bole canker host



D. Necrotic lesion in
inner bark under
bleeding canker in
outer bark



E. Sporulation* on
fallen leaves³

① Primary inoculum (sporangia) produced on infected leaves is carried to new hosts via rain splash and air currents.^{3,12}

② Secondary inoculum (sporangia or zoospores) is carried down stems by rainwater to infect lower portions of the tree. The pathogen infects the inner bark and sapwood, resulting in a bleeding canker. It is uncertain how the pathogen infects the bole, although zoospores applied to unwounded bark are capable of causing cankers.^{2,3,11,13}

③ Secondary inoculum produced in the canopy is also splashed or blown onto understory tree and shrub hosts causing local intensification of disease.^{3,12}

④ Infected leaves fall to the ground where they also serve as a source of inoculum.³

⑤ Sporangia produced on fallen leaves are carried to lower stems and leaves of trees and shrubs by rain splash and possibly air currents.³

⑥ Pathogen propagules likely enter the soil through decomposing litter or are carried into soil by rainwater. The soil phase of the disease cycle is poorly understood, but it is clear that the pathogen can persist in soil for several months. Chlamydospores are presumed to have a role in long-term survival although the triggers for germination are not known. There is little evidence of root infection in the forest.^{3,5,8,9,13}

Do your pear trees look terrible in in wet years?



When is the best time to prune this?

Before drip and splatter spread inoculum

Before defect exceeds 30% of circumference

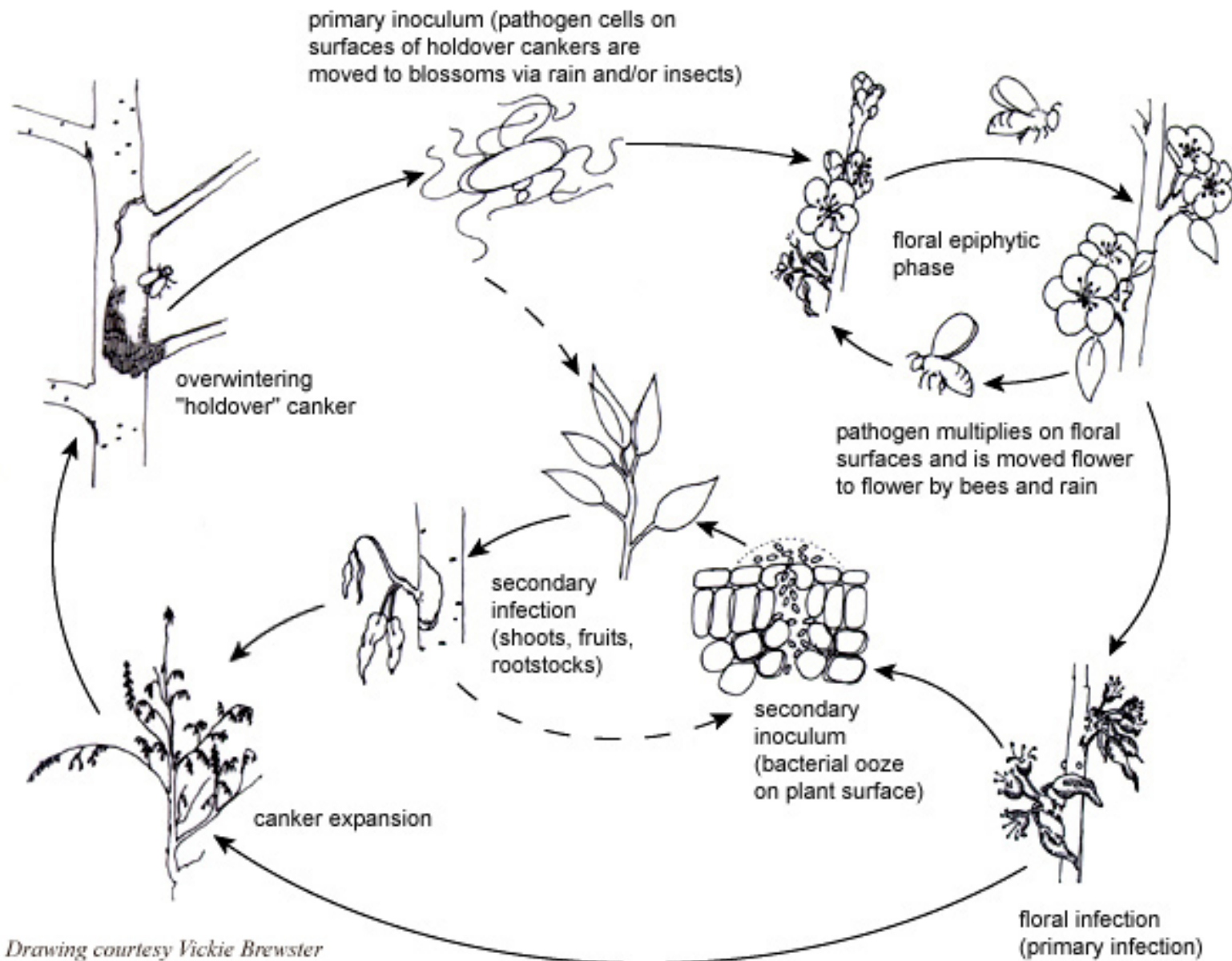
Before it spreads to every tree in the neighborhood

Do the plants have enough foliar material to pull treatments into canopy

Is there enough vascular tissue to move corrective measures throughout the plant

Will the toxicity of a pesticide prior to corrective measures harm plant even more?





Do you Sycamores look wilted after a spring rain?



When do you treat Sycamores to prevent this?



Increased issue in spring of 2019

Blights & Leaf Spot

Bacterial Blight

Bacterial blight, also called blossom blight or shoot blight, is a tree disease caused by the bacterium *Pseudomonas* s.. Rainy weather promotes and helps to spread bacterial blight.

Combat bacterial blight by pruning off branches with dieback or blight and by improving air circulation around trees.

Bacterial blight may cause premature leaf drop, but usually does not kill trees unless cankers girdle the tree.



Increased issue in spring of 2020

- **Oak twig blight—*Cryptocline cinerescens***
- **Life cycle**
- Twig and foliar blight diseases tend to be more severe in years when frequent rains coincide with when new leaves are being produced. The fungi infect the current season's growth and cause the shoots to die.
- **Solutions**
- Provide infected trees with adequate cultural care, especially appropriate watering. Unless they were raised with irrigation (e.g., planted oaks), avoid irrigating native oaks during the dry season; irrigate during the winter, if needed, when rainfall has been below normal. Avoid applying fertilizer, which can favor excessive shoot growth, leading to a denser, slower-drying canopy more susceptible to these diseases.



Asking questions?

DON'T FERTILIZE newly planted or young trees in the fall.

- Apply slow-release fertilizers on established trees.
- Applications of nitrogen will encourage new tree growth which won't have a chance to harden off before winter.



Asking questions?

If you're fertilizing your lawn, you're also fertilizing any trees nearby. Late season nitrogen can produce growth that is susceptible to frost.



Fall tree care

WATER trees before freeze-up.

Tree roots remain active until soil temperatures dip below 40 degrees.

Watering is especially beneficial for evergreens, which transpire tiny amounts of moisture through their needles throughout the winter months.



How does frost damage work...

As ice crystals form between cells, the water inside the cells is drawn out through the cell walls. This causes the cells to get smaller. The resulting pressure and stress may cause the walls to break.

If the temperature drop is sudden and extreme, ice crystals may form inside the cells of some species rupturing the cell protoplasm”... which kills the cell.



Moist soil stays warmer than dry soil

Water acts as an insulator. Plant cells that are plump with **water** will be stronger against cold damage. Likewise, moist soil will tend to stay warmer than dry soil, so a regular **watering** schedule in dry, cold weather can help protect plants from **freezing** temperatures.



****Moist soil stays warmer than dry soil****



Which herbicides are used this time of year?

It's Pre-emergent season

HERBICIDE APPLICATIONS should be done with caution around trees and plants.

Dithiopyr & Isoxaben-Safe around established plants.

Indaziflam-Not safe around plants

Triclopyr – (Post) Growth Regulator



Right in front of us but hard to see

Non-ag environments have a range of permanent soil-borne disease organisms which are usually contained in a balanced environment where organisms, soil conditions, and hosts interact in a complex system.

Garden plants only show symptoms of disease when this balance is disrupted and pathogen organisms become dominant.

Balanced?



Plant Diseases

Conditions that favor soil borne pests

- Standing moisture, Poor drainage, contamination, high traffic areas, climate, topography
- Climate

Strategies to reduce soil pest problems

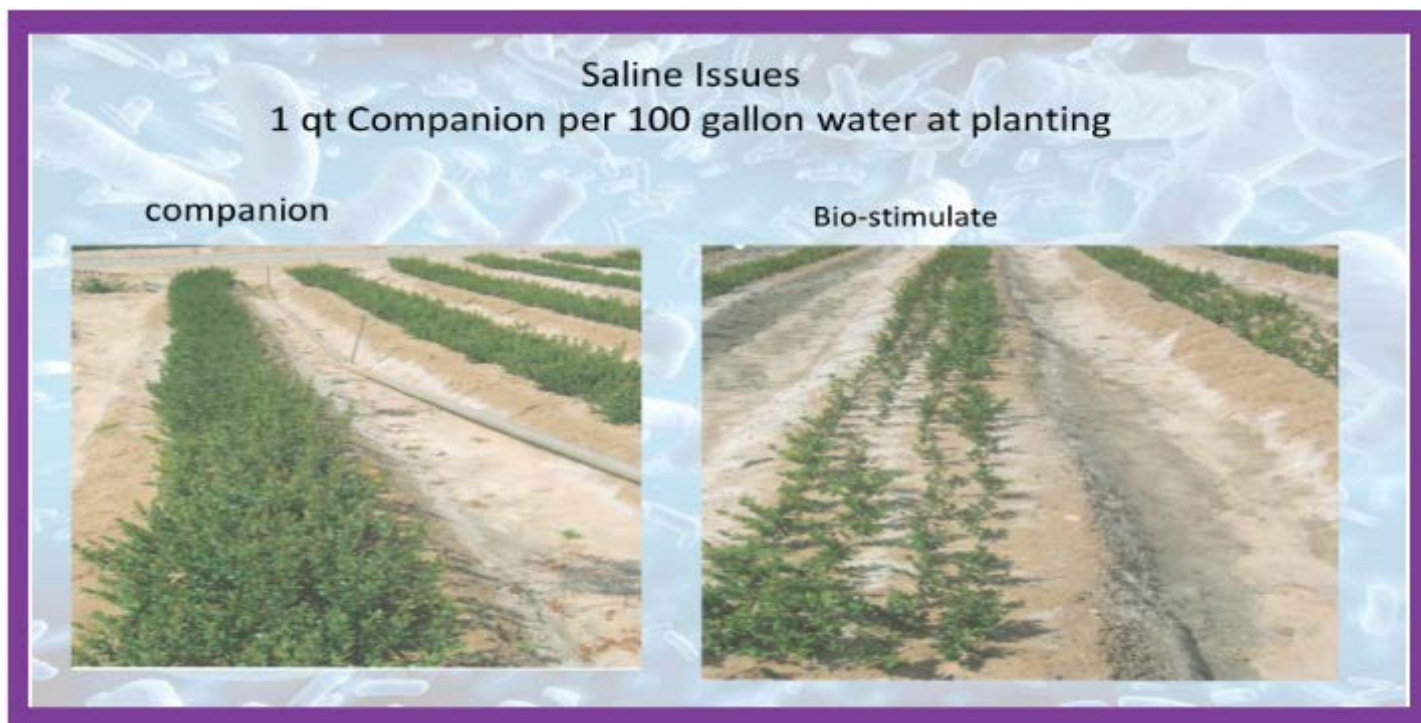
- Plant selection, proactive soil conditioning, plant density, pesticide applications, root zone protection areas
- Beneficial/Bio control



Use the season to your advantage?

What's going on with trees these days?

- Salt buildup from reclaimed water
 - Great time to apply Gypsum & Sulfur or soluble calcium
- Flush salts through profile with seasonal rains



The only constant is change...

What's going on the news these days?

- Rumblings of a new movement that pesticides & fertilizers kill beneficial microbes
 - Reclaimed water/salts are more damaging
 - Bacillus (a colonizer is pretty tolerant)
 - Mycorrhizae is a negative charge and more susceptible to salts
 - Humic acid ,micros, soluble calcium products (positive charge)

Pesticides include a large group of chemical agents that attempt to eliminate destructive biological forces in agriculture. ... While these chemicals supposedly only target specific species, repeated use inevitably **kills** microbial life that is beneficial to the soil system. Mar 13, 2015



It is recommended to treat either in the **fall then spring, or spring then fall the first year.**

Follow up treatments should be only in the fall annually (avoid treatments when temperatures are very low).

The treatment is not recommended for trees that have had symptoms for six months or longer



Salt and Salinity / Reclaimed Water -Treatment

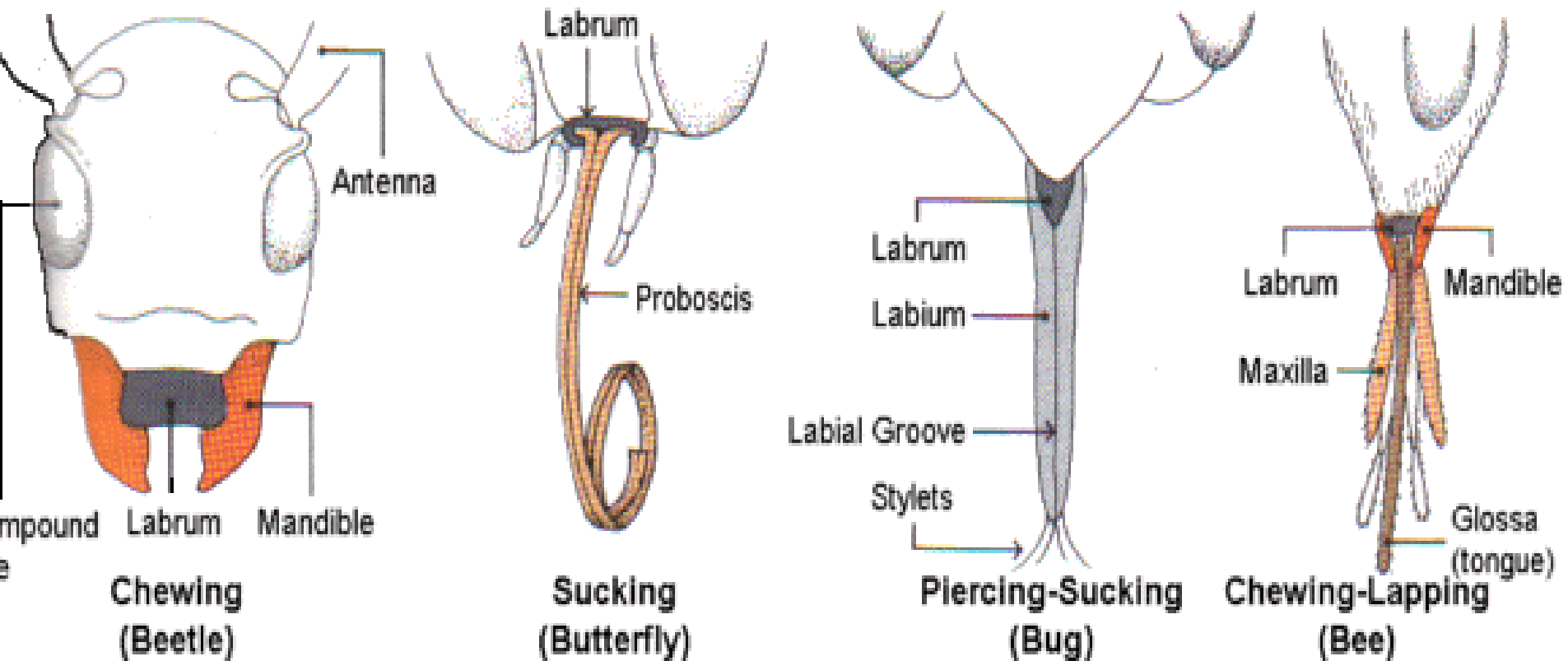
- Essential Plus
 - Companion Biological Fungicide
 - HydroMax
 - and low-salt Nitro+K 22-0-16
-
- Melt that salt off
 - Use spring rain to flush it out



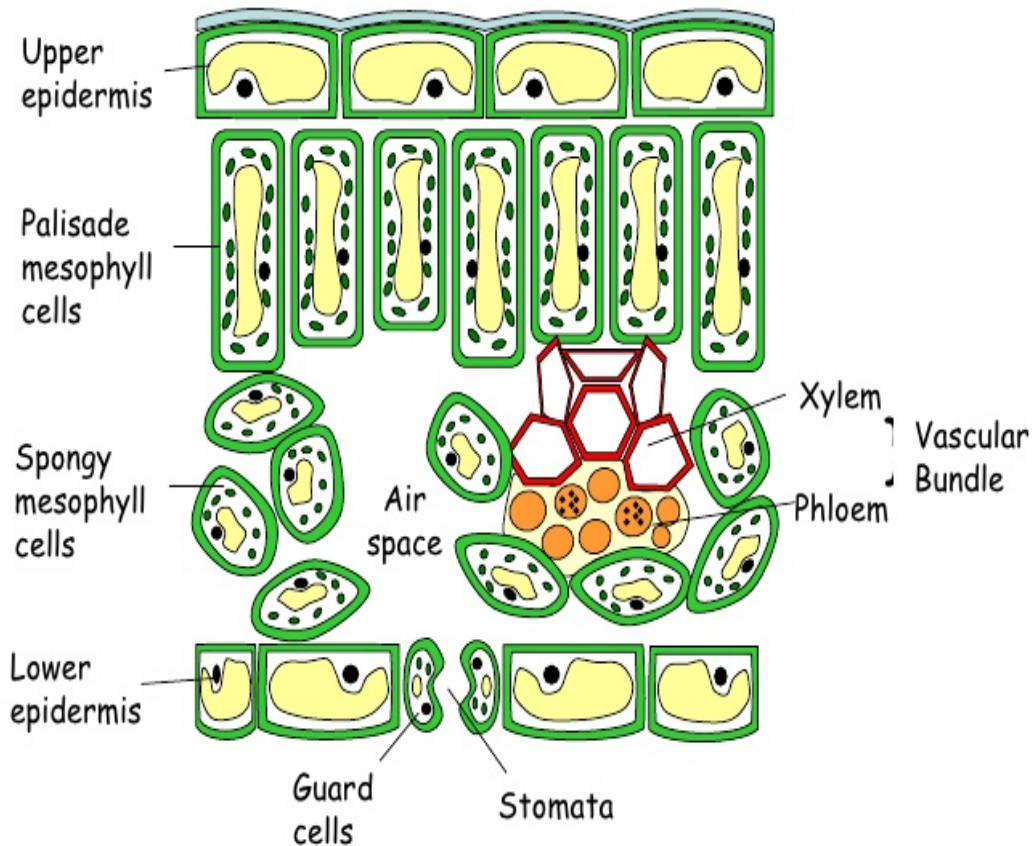
INSECTS



WHY DO WE CALL THEM SUCKING INSECTS?



Leaf Structure



WHERE DO THEY FEED?
WHAT PART OF THE PLANT?
IT ALL DEPENDS...

Aphids feed on the
phloem

Sharpshooters feed on
the Xylem

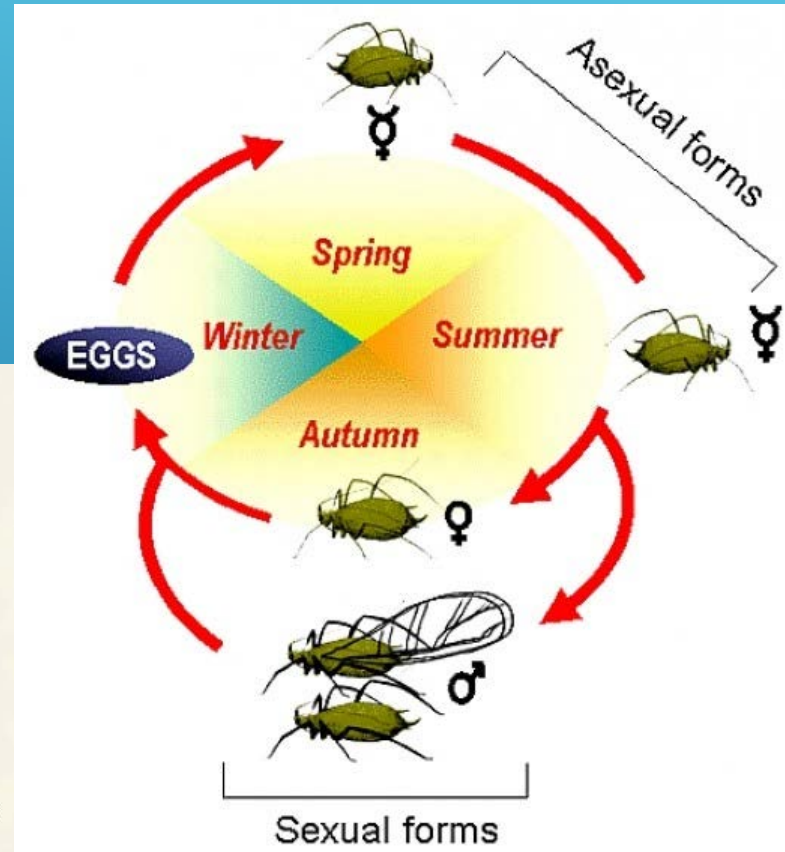
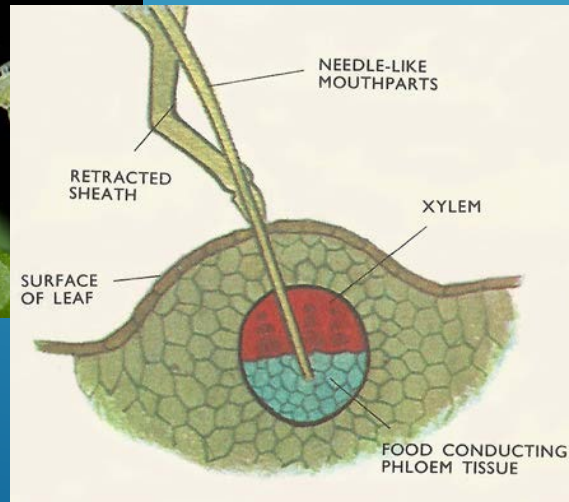
Mites feed on the
epidermis

Scale feeds on the
epidermis

Whitelfy feeds on the
phloem

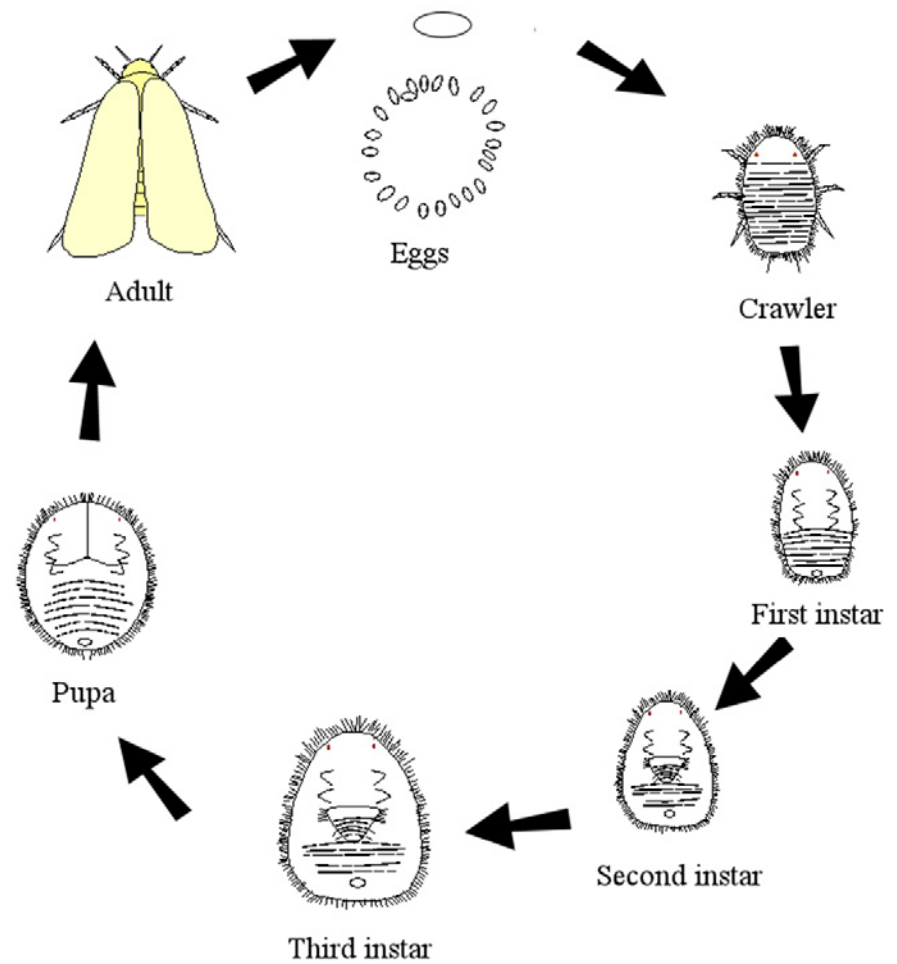
LETS MEET OUR CAST OF CHARACTERS

Aphids

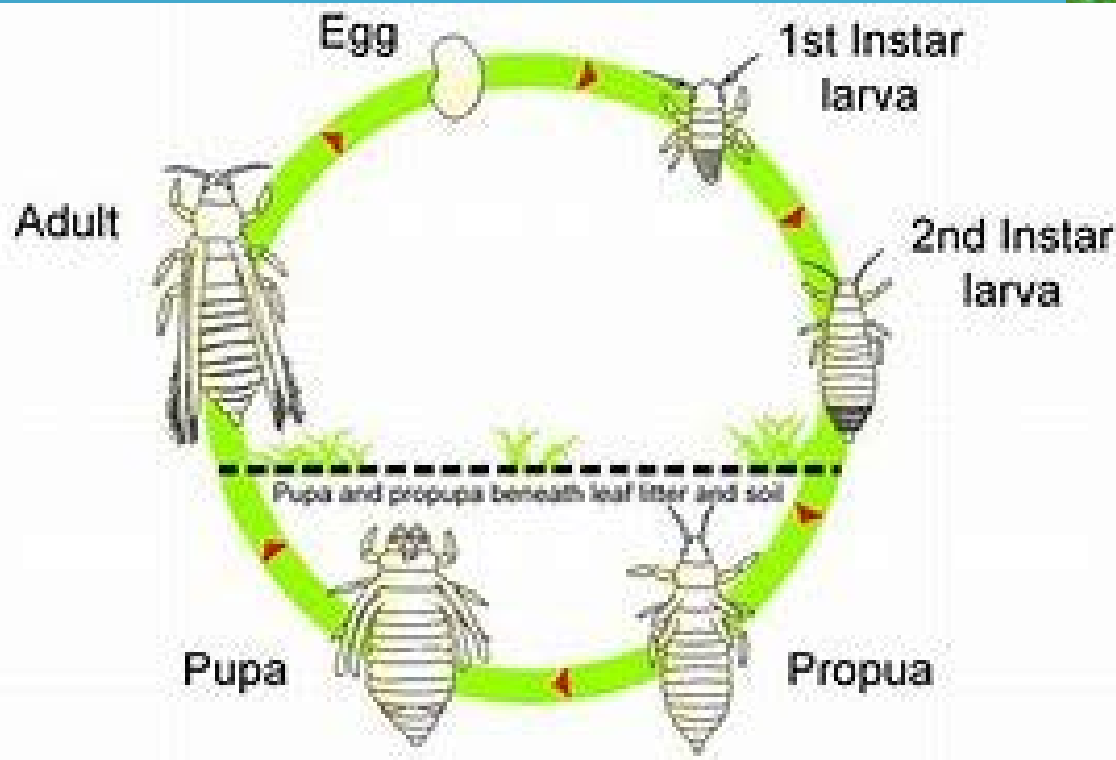
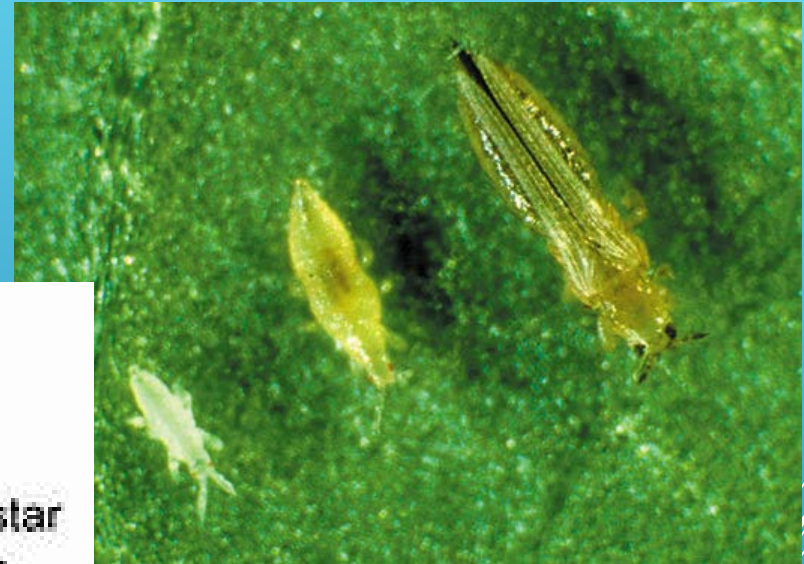




WHITE FLY



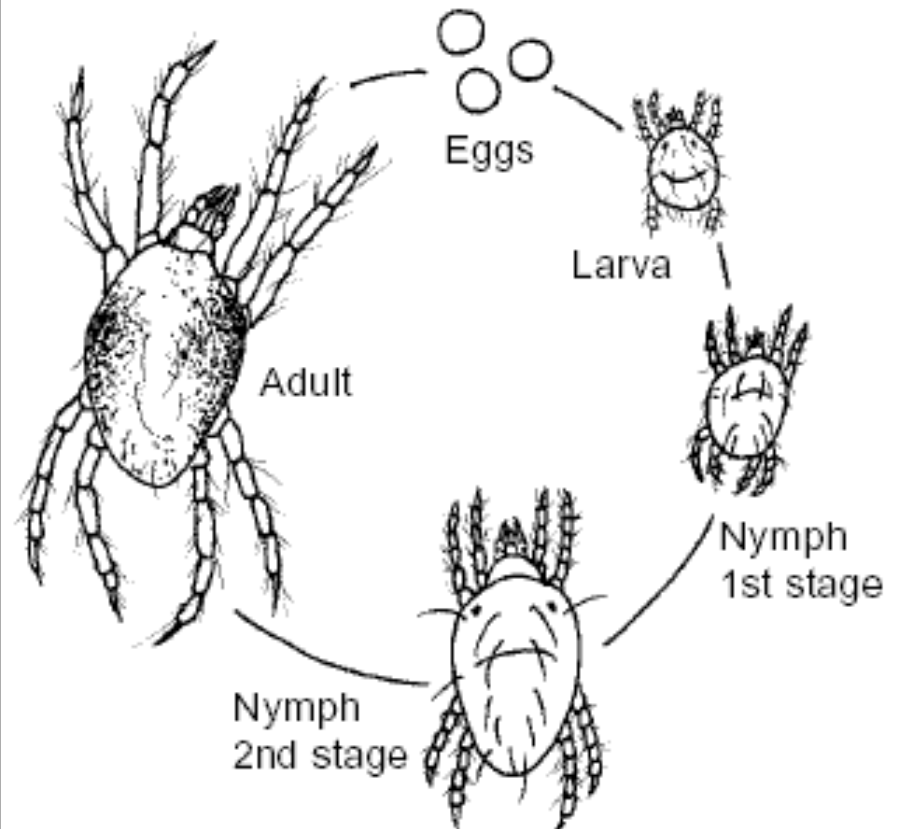
THRIPS



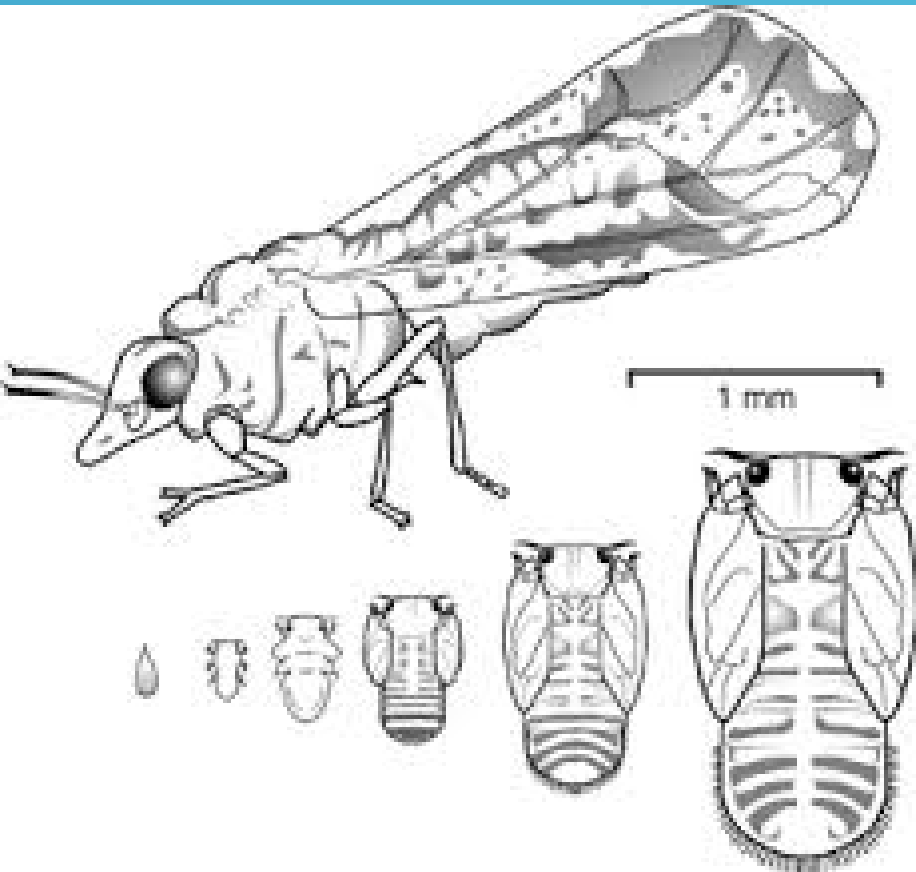
SPIDER MITES



**Figure 1. Two-Spotted Spider Mite
Life Cycle 8 – 40 Days**



PSYLLID



- Transmit disease
- Disfigure landscape plants
- Black sooty mold
- Stunting of plant growth



SHARP SHOOTERS.

Transmit various diseases



LEAF HOPPERS

SCALE

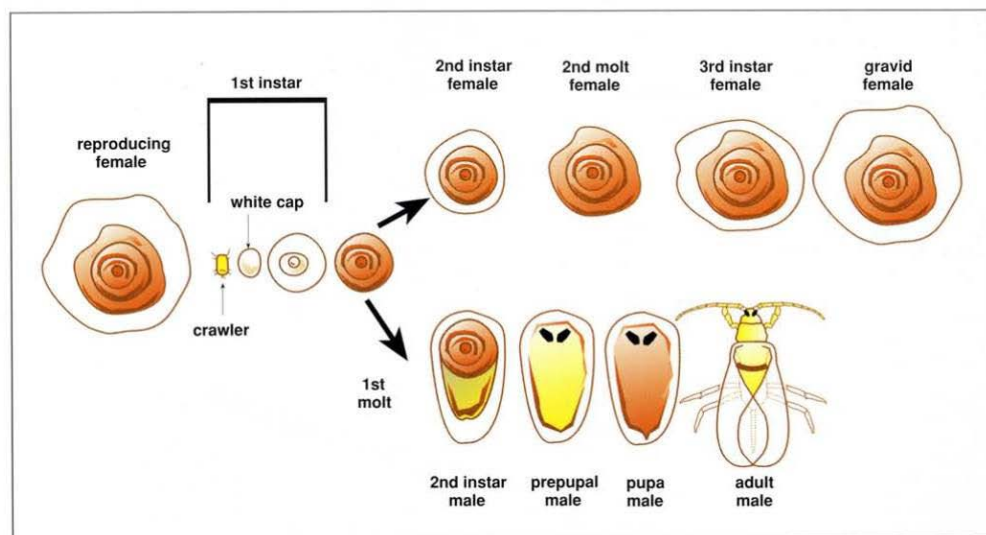


Figure 3. Life cycle of California red scale

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Statewide Integrated Pest Management Program

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What's New

- Pest Alert!** [Huanglongbing found in Riverside](#)
- Highlights:** [2016 Annual Report](#)
- [Strategic plan 2015-2025](#)
- [Ag Pest Management: Strawberry and Cole Crops revised](#)
- [Pest Notes: Brown Recluse and Other Recluse Spiders and Asian Citrus Psyllid and Huanglongbing Disease revised](#)
- [Retail Nurseries & Garden](#)

GIVING TUESDAY | Support UC IPM's mission of making ecosystem-based integrated pest management

Home, Garden, Turf & Landscape Pests



Agricultural Pests

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Homes, Gardens, Landscapes, and Turf

Trees, shrubs, & woody ornamentals

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. (See also [cultural tips](#))

Click on a table heading to sort the column (requires Javascript).
▲ = Ascending ▼ = Descending ◆ = Unsorted

Common name	Scientific name	Family
Abelia	<i>Abelia</i> spp.	Caprifoliaceae (Honeysuckle family)
Abutilon	<i>Abutilon</i> spp.	Malvaceae (Hibiscus family)
Acacia	<i>Acacia</i> spp.	Fabaceae (Pea family)
African fern pine	<i>Podocarpus</i> spp.	Podocarpaceae (Podocarpus family)
Agave	<i>Agave</i> spp.	Agavaceae (Agave family)
Albizia	<i>Albizia</i> spp.	Fabaceae (Pea family)
Alder	<i>Alnus</i> spp.	Betulaceae (Birch family)

Common names

Top

A K-L

B M

C N

D O-P

E Q-R

F S

G T

H U

I-J V-Z

Bottom

WHERE TO GET HELP

How to Manage Pests

Pests in Gardens and Landscapes

More trees and shrubs

Tulip tree (Yellow poplar)—*Liriodendron tulipifera* Family Magnoliaceae (Magnolia family)

Plant identification

Tulip tree is a straight, columnar, trunked deciduous tree with spreading pyramidal branches. It makes a lovely large shade, lawn, or screen tree. It has a moderate growth rate and grows to 60 to 80 feet tall. During the late spring, 2-inch yellowish tulip-shaped flowers compliment the tulip-shaped leaves. In the fall, leaves turn a brilliant yellow color.

Optimum conditions for growth

Tulip tree is native to the eastern United States. It is widely adapted to most areas, except in well-drained, acidic or organic-rich soil. Trees do best in full sun. Provide adequate irrigation.

Pests and disorders of *Liriodendron tulipifera*

Invertebrates

- [Aphids](#)
 - Tuliptree aphid
- [Mealybugs](#)
- [Soft scales](#)
 - Tuliptree scale

Diseases

- [Armillaria root](#)

All scale life stages may be present throughout the year in areas with mild winters.

Armored Scales

Most species of armored scales have several generations a year and overwinter primarily as first instar nymphs and adult females. Except for crawlers and adult males, armored scales lack obvious appendages and spend their entire life feeding at the same spot.

Soft Scales

Most soft scales have one generation each year and overwinter as second instar nymphs. The brown soft scale is an exception; it has multiple generations and females and nymphs can be present throughout the year. Most immature soft scales retain their barely visible legs and antennae after settling and are able to move, although slowly.

DAMAGE

Some scale species, when abundant, weaken a plant and cause it to grow slowly. Infested plants appear water stressed, leaves turn yellow and may drop prematurely, and plant parts that remain heavily infested may die. The dead brownish leaves may remain on scale-killed branches, giving plants a scorched appearance. If the scale produces honeydew, this sticky excrement, sooty mold, and the ants attracted to [honeydew](#) can annoy people even when scales are not harming the plant.

The importance of infestations depends on the scale species, the plant species and cultivar, environmental factors, and natural enemies. Populations of some scales can increase dramatically within a few months when the weather is warm, and honeydew-seeking ants protect scales from their natural enemies. Plants are not harmed by a few scales and even high populations of certain species apparently do not damage plants.

MANAGEMENT

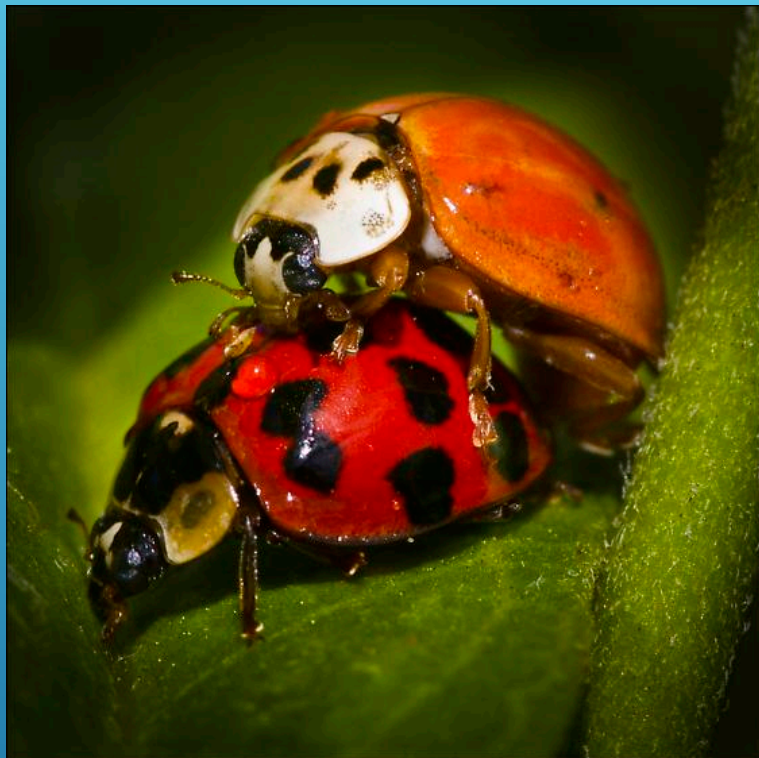
Many species are usually well controlled by beneficial predators and parasites (natural enemies). Exceptions are when natural enemies are disrupted by ants, dust, or the application of persistent broad-spectrum insecticides. Preserving (conserving) parasites and predators (such as by controlling pest-tending ants) may be enough to bring about gradual control of certain scales as natural enemies become more abundant.

A well-timed and thorough spray of horticultural (narrow-range) oil during the dormant season, or soon after scale crawlers are active in late winter to early summer, can provide good control of most species of scale. Certain scale problems on large plants and hosts especially sensitive to scale damage may warrant the application of a systemic insecticide. If plants perform poorly or are repeatedly damaged by pests, the best course of

PLENTY OF INFO



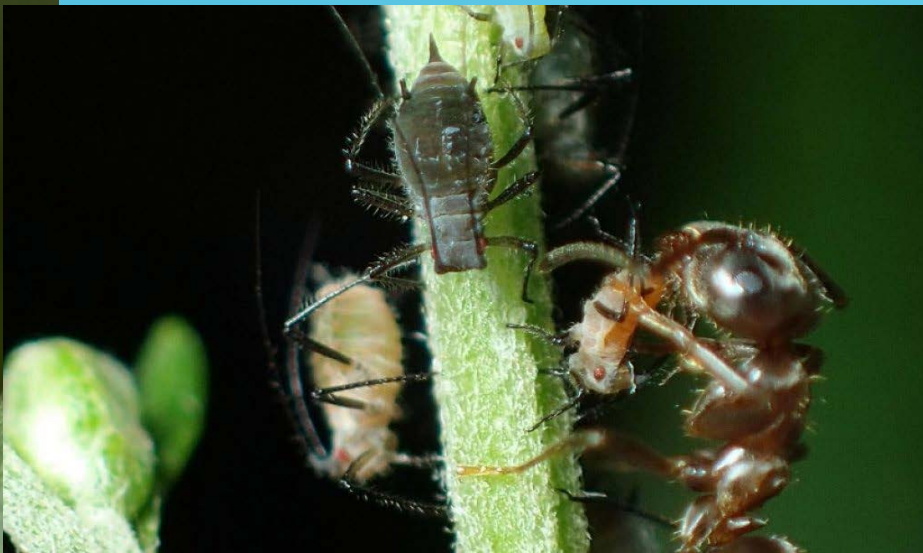
ID THAT SUCKER!



BEING DISCRETE

PREDATORS & BENEFICIALS





ANTS... WHAT DO THEY INDICATE?



PYSLID ON BLACKBERRY &
EUCALYPTUS

THE GOOD



Soldier beetle larvae feed on the eggs and larvae of beetles, grasshoppers, moths and other insects. Adults feed on aphids and other soft-bodied insects, but mainly on flower nectar and pollen.





THE BAD





THE UGLY – (BUT GOOD?)



THE REALLY UGLY – SPIDER MITES &
WINGED APHIDS



1/9 The polyphagous shot hole borer beetle on a sycamore tree in Craig Regional Park in Fullerton.

The polyphagous shot hole borer breeds by penetrating into tree trunks and in the process emitting a lethal fungus that prevents the transport of water and nutrients from roots to the leaves.

Trees species at most risk



4.5 million
California
live oak



2.9 million
Prunus species
(Almond, peach,
cherry, etc.)



2.5 million
Avocado



1.8 million
Citrus
species



1.4 million
Fraxinus
species
(Ash)

Source: U.S. Forest Service

@latimesgraphics

THE REALLY REALLY BAD – POLYPHAGOUS SHOT HOLE BORER

(27 MILLION TREES IN JEOPARDY)

VECTERING A LETHAL FUNGUS THAT DAMAGES VASCULAR CAPACITY



APHIDS



SOOTY MOLD-HONEYDEW (APHIDS,
SCALE, WHITEFLY, & THRIPS)



THRIP DAMAGE-REMOVES CHLOROPHYL



MEALYBUG



LEAF HOPPER DAMAGE-POTATO,
ACER RUBRUM, GRAPES



Xylella fastidiosa

Bacteria



SHARP SHOOTER-VERY SHY



MEALYBUGS



SPIDER MITES



Leaf Stippling

Leaf stippling describes the damage done by sap-sucking insects that **leaves** a spotted appearance to the **leaves**. ... **Leaf stippling** won't seriously harm an otherwise healthy plant, but it can interfere with photosynthesis and may compound water-stress. If **leaf stippling** is visible, be sure to inspect plants for the cause.



SCALE REDUCTION

- ▶ High Visibility (Liriodendron & Magnolia)
- ▶ Armored & Soft Scale most destructive
- ▶ 'Soft' scale only one that produces honeydew
- ▶ Trunk Injections (Greyhound or AceJet/Azasol)



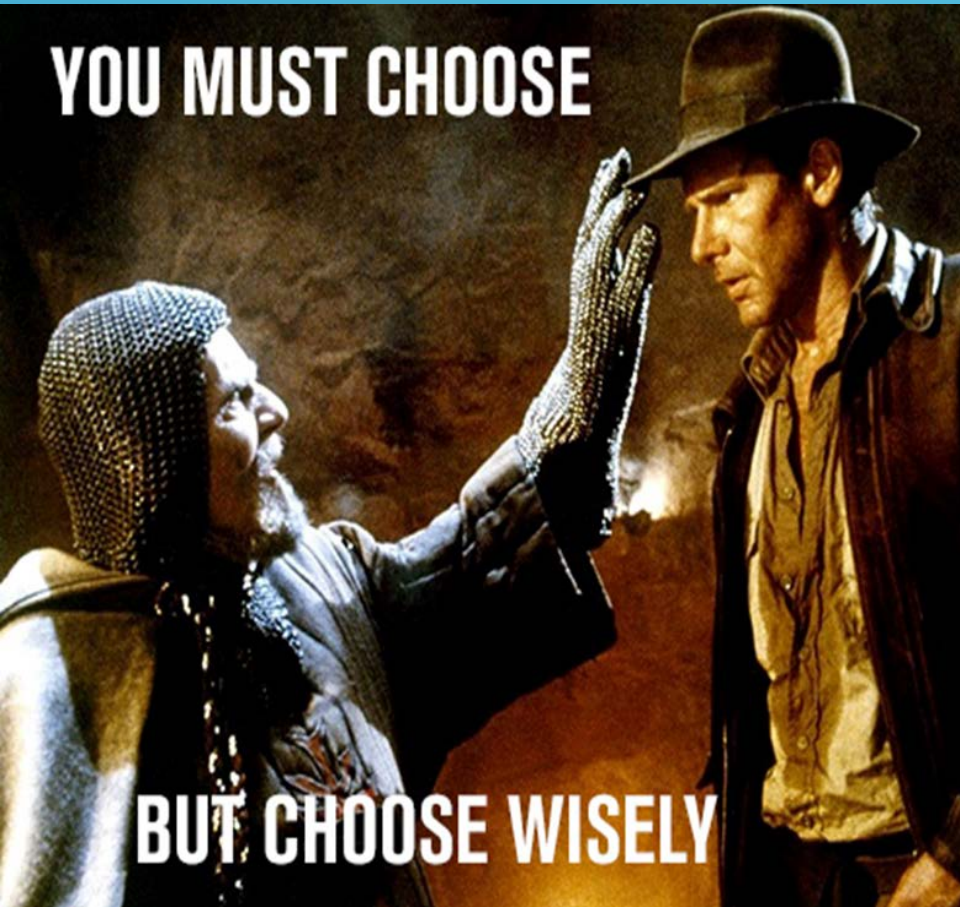
TULIP TREE SCALE-NOT CAVIAR

What to consider for treatments



WHAT / HOW AM I GOING TO TREAT WITH?

YOU MUST CHOOSE



BUT CHOOSE WISELY

- Discuss possible options with others
- Consult with university personnel PCA's, manufacturers
- Try and find as host specific of a material as possible
- Look for materials that will have the least environmental impact

- ▶ Organics

- ▶ Azadirachtin
- ▶ Organic Spray Oil
- ▶ Soaps
- ▶ Neem Oil
- ▶ High Pressure Water

- ▶ Systemics

- ▶ Imidacloprid
- ▶ Azadirachtin
- ▶ Dinotefuran
- ▶ Emamectin benzoate-mites
- ▶ Abamectin-Mites, Aphids, Thrips and Whiteflies.

APHIDS & WHITEFLY

Contact (Inorganic)

- ▶ Organophosphate
- ▶ Cyfluthrin
- ▶ Bifenthrin
- ▶ Acephate



Phytophthora ramorum

While there is no known cure for infected trees, the phosphonate compound Agri-Fos® is registered with the California Department of Pesticide Regulation as a preventative treatment for *Phytophthora ramorum* on oak and tanoak trees.



Phytophthora ramorum

Excising plant tissue?

Disinfect often!

PHC regimen

Signs of callusing?



Fire Blight

Where do you start?

- Prune out the diseased wood
- Remove infected branches, stems, tips

With what?

Focus on :

- Copper products (only thing
 - Available to home owners)
- Mono & di-potassium salts of
 - Phosphorus acid
- Oxytetracycline Hydrochloride
- *Bacillus amyloliquefaciens*



Powdery mildew

Where do you start?

- Thin canopy to increase air flow
- Remove infected branches, stems, tips

With what?

Focus on :

- Phosphorus acid
- Pyraclostrobin,
- Potassium bicarbonate
- Propiconazole
- Trifluoromethyl



Anthracnose

Where do you start?

- Thin canopy to increase air flow
- Remove infected branches, stems, tips

With what?

Focus on :

- Phosphorus acid
- Propiconazol
- Potassium bicarbonate
- Propicanizol
- Trytricanizol



Treatment

Blights & Leaf Spot

Drenching, Basal, & Foliars

Phosphorus Acid-Basal

Pyraclostrobin-Drench

Copper-Foliar (Spring)



Anthracnose

Phosphoric acid – source of nutritional acid

(ie: 6-20-20, 9-9-9, 15-15-15, 20-20-20, 0-45-0)



Tree grubs

Where do you start?

- Unexplained tree decline
- Root crown inspection



Tree grubs-Fall

Where do you start?

- Unexplained tree decline
- Root crown inspection

Acelpryn:

- May be applied for control of white grubs and other listed pest
- Caterpillars, clearwing moth borers
- Landscape ornamental (trees, shrubs, foliage plants, flowers, &
- non-bearing fruit trees that will not produce fruit during season of application

Growth Regulators

- Paclobutrazol-
Shortstop 2SC (Trees)

Anytime as long as:

- soil is not frozen
- Saturated
- Or tree is under stress



Drenching, Soil injection, & basal applications

- Spring applications
Systemic Insecticides-Drenching, Soil Injection, & Foliar
- Neonicotinoids – ‘Bee Diamond’
 - Broad spectrum Insecticides
- Imidacloprid (Merit or Criterion)
- Dinotefuran (Safari)
- Clothianidin (Arena)
- Flupyradifurone(Altus)



- Spring applications
Systemic Insecticides-Drenching, Soil Injection, & Foliar
- Neonicotinoids – ‘Bee Diamond’



PROTECTION OF POLLINATORS

APPLICATION RESTRICTIONS EXIST FOR THIS PRODUCT BECAUSE OF RISK TO BEES AND OTHER INSECT POLLINATORS. FOLLOW APPLICATION RESTRICTIONS FOUND IN THE DIRECTIONS FOR USE TO PROTECT POLLINATORS.



Look for the bee hazard icon in the Directions for Use for each application site for specific use restrictions and instructions to protect bees and other insect pollinators.

This product can kill bees and other insect pollinators.

Bees and other insect pollinators will forage on plants when they flower, shed pollen or produce nectar.

Bees and other insect pollinators can be exposed to this pesticide from:

DIRECTIONS, AND WITH ALL APPLICABLE STATE AND FEDERAL REGULATIONS.

FOR COMMERCIALLY GROWN ORNAMENTALS NOT UNDER CONTRACT FOR POLLINATION SERVICES BUT ARE ATTRACTIVE TO POLLINATORS



- Do not apply this product while bees are foraging.
- This product is toxic to bees exposed to residue for more than 38 hours following treatment.
- Do not apply this product to blooming, pollen-shedding or nectar-producing parts of plants if bees may forage on the plants during this time period, unless the application is made in response to a public health emergency declared by appropriate state or federal authorities.



Do not apply Safari® 20 SG Insecticide while bees are foraging. Do not apply *Safari* 20 SG Insecticide to plants that are flowering. Only apply after all flower petals have fallen off.

- Spring applications
Systemics w/ Imidacloprid
- Imidacloprid (Merit or Criterion)
 - Criterion 2F (Liquid)-Foliar, Drench, or Soil Injection
 - 80oz/100 gal-1quart per inch of DBH
 - .46-.6 fl oz / 1000 sq ft in 10 gallons of water per 1000 sq ft (Drench)
 - WSP – 1.6oz packet will treat 8,000 – 10,000 sq ft for larvae



- Clothianidin (Arena)

- Used mainly for Turf grubs – Japanese Beetle larvae
- Typically summer application
- Treat when signs of damage occur (Raccoon or wild pig)



Early indications of grub infestation are irregular patches of dry grass, flocking birds, or areas of turf being torn up by raccoons, possums and skunks looking for a tasty treat.



If grubs have been eating the root system, patches of turf will come up easily from the soil surface, like pulling up a corner of carpeting, and the soil will be full of grubs.



- Chlorantraniliprole (Acelepryn)

- Used mainly for Turf grubs
- Suspension concentrate
- Granular & Liquid
- Great proactive
- 1.5-2.3lbs/1000(125/ac)
- .55 fl oz/1000 sq ft



Early indications of grub infestation are irregular patches of dry grass, flocking birds, or areas of turf being torn up by raccoons, possums and skunks looking for a tasty treat.



If grubs have been eating the root system, patches of turf will come up easily from the soil surface, like pulling up a corner of carpeting, and the soil will be full of grubs.



Merit-Cheapest-Shortest window
Arena-Mildly more expensive-longer
window
Acelepryn-Expensive-Longest Window



- Spring applications
- Dinotefuran (Safari) – Drench, Foliar, or Basal Bark application
 - 12oz per 24" of DBH
 - ¼-1/2 lb per 100 gallons
 - 100 gallons to treat 20,000 sq ft
 - 1-4 pints per foot of plant height
 - Scale
 - Pine needle scale
 - Aphids
 - Mealy Bug
 - Moves through Phloem
 - **Fast Acting**
 - Not cheap



Safari®
20 SG INSECTICIDE



OR FOLIAR AND SYSTEMIC INSECT CONTROL
ON ORNAMENTAL PLANTS AND VEGETABLE
TRANSPLANTS IN ENCLOSED STRUCTURES.
OR GREENHOUSE, NURSERY, INTERIOR PLANT-
CAPE AND OUTDOOR LANDSCAPE USE ONLY

GROUP 4D INSECTICIDE



Altus™

For insect control in landscape and production ornamental plants, greenhouse vegetables and transplants, fruits, and nut trees. Not for use in residential greenhouses.

ACTIVE INGREDIENT:

Flupyradifurone* 17.09%

OTHER INGREDIENTS: 82.91%

TOTAL: 100.00%

Contains 1.67 pounds Flupyradifurone per gallon

*CAS Number 951659-40-8

EPA Reg. No. 432-1575

**KEEP OUT OF REACH OF CHILDREN
CAUTION**

AI: Flupyradiflurone

Pests: Aphids, Citrus leaf miner,
White fly

Application: Drench, soil injection,
Or foliar

NO Bee Label (Roseville)

App rate: 7-14 fl oz/Acre

Fruit control

- Paclobutrazol
- Dikegulac sodium
- Naphthaleneacetic acid, ammonium salts (olive stop)
- Fruit control – Timing is critical
- It's fruit 'reduction' not 'elimination'



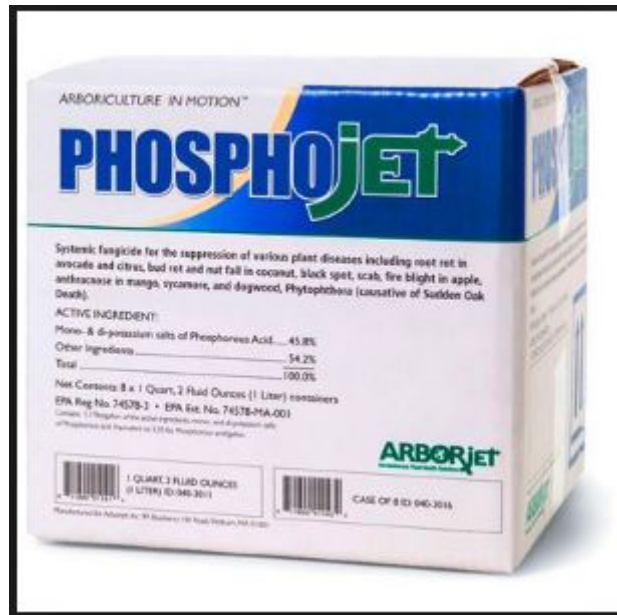
Tree Injection Chemicals

- Insecticides
- Fungicides
- Plant growth regulator (not labeled in CA yet)
- Nutrients



Fungicides

- Phosphoric acid
- Propiconazole
- Oxytetracycline - antibiotic



Insecticides

- Emamectin benzoate
- Imidacloprid
- Acephate
- Acetamiprid



Herbicides

- Triclopyr



•Plant Health Care

- Growth Products
 - Improve soil conditions first
 - Soil penetrants & surfactants to make fertilizers go further
 - Focus on root development for systemic defense mechanisms
 - More roots = more resistant to stress
 - Chlorosis may be an easy fix with foliar application.
 - (Drenching and foliar are long lasting and fast acting)



Tree Health Care

- Humic Acid
- Micros
- Sugars
- Mycorrhizae
- Bacillus

****Build up those systemic defense mechanisms****

.



Equipment and Applications



What equipment do you have?

- Foliar applications
- Soil drenching
- Soil injection
- Tree injection-Spray rig in a box
- Basal bark treatment



Foliar Applications

- Rapid results (through the stomata is fast)
- Equipment options may be limited
- Drift
- Public perception
- Fastest route pesticides enter the body?
- Fastest route nutrients enter plant tissue?

“Foliar applications for tree health care is significantly under utilized due to ‘tree spraying stigma’”

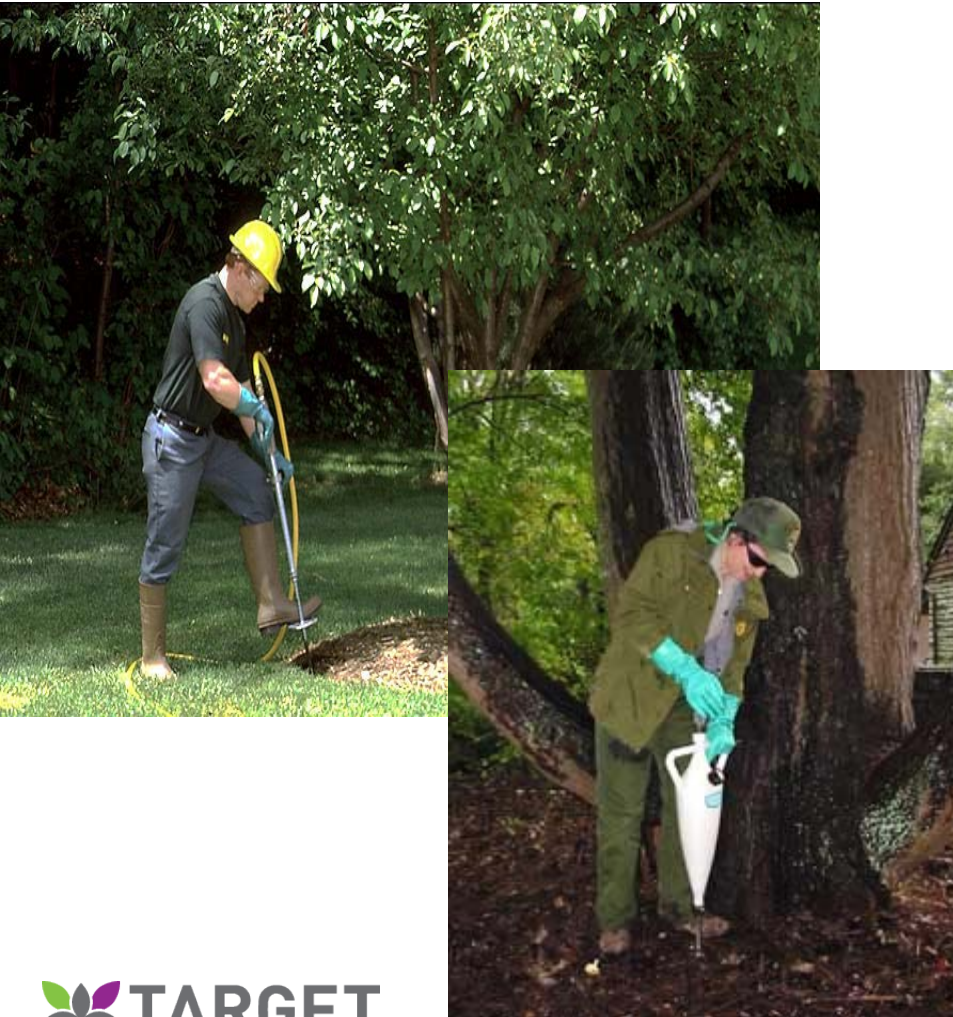


Basal Drench



- Mainly for Tree Growth Regulators (Shortstop)
- Low Tech
- No secondary flare up
- Slow
- Limited chemical options
- Performance dependent on health of tree
- Potential for waste if not done correctly

Soil Injection



- Low environmental impact
- Insecticides
- Fungicides
- Tree Health Care cocktails
- Puts material directly into root zone
- Easy to do.
- Improved public perception

Trunk Injection options

- Mauget
- Arbor-Jet
- Arborsystems



Tree injection



- Rapid results
- Multiple chemical options
- Minimal equipment
 - Several options
- No drift
- High up-front cost
- Damage to tree
- Time consuming

Capsules

- No Mixing
- Closed system
- Multiple chemical options
- Reduced labor
- No drift
- Tree wounding
- Slow to drain

What's wrong with this picture?
Why?





Upgra
W
cli

QUIK-jet Pro Kit

- Minimal wounding
 - Fast applications
 - No power eq required
 - No chemical mixing
 - Many chem options
-
- Dosages can be low
 - High initial investment



Basal Bark Treatments



- Very cost effective
- Rapid application
- Low equipment investment
- Fast results
- Material options
 - Phosphorus Acid
 - Insecticides
 - Herbicides for woody weeds

TANK FIX or buffer!!

Reduce pH to neutral

- Extend life and effectiveness of pesticides
 - Increase Efficacy
 - Easy to use
 - Low initial cost
 - Reduce pesticide usage
- CMR No Foam B & Turf Fuel 'Tank Fix' (red when nuetral), pH reducer



But if you get it right...



Every situation is
different. Need help?

Questions?



Thank you!

Eric Carlson

Target Specialty Products

San Jose, CA

QAL, PCA, & ISA Arborist

Mobile: (408)398-8203

