COMMON PESTS AND MANAGEMENT

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Outline

- California oakworm / oakmoth
- Light brown apple moth (LBAM)
- Myoporum thrips
- Aphids
- Scales and mealybugs
- Whiteflies
- Thrips
- Management
- How to get more information

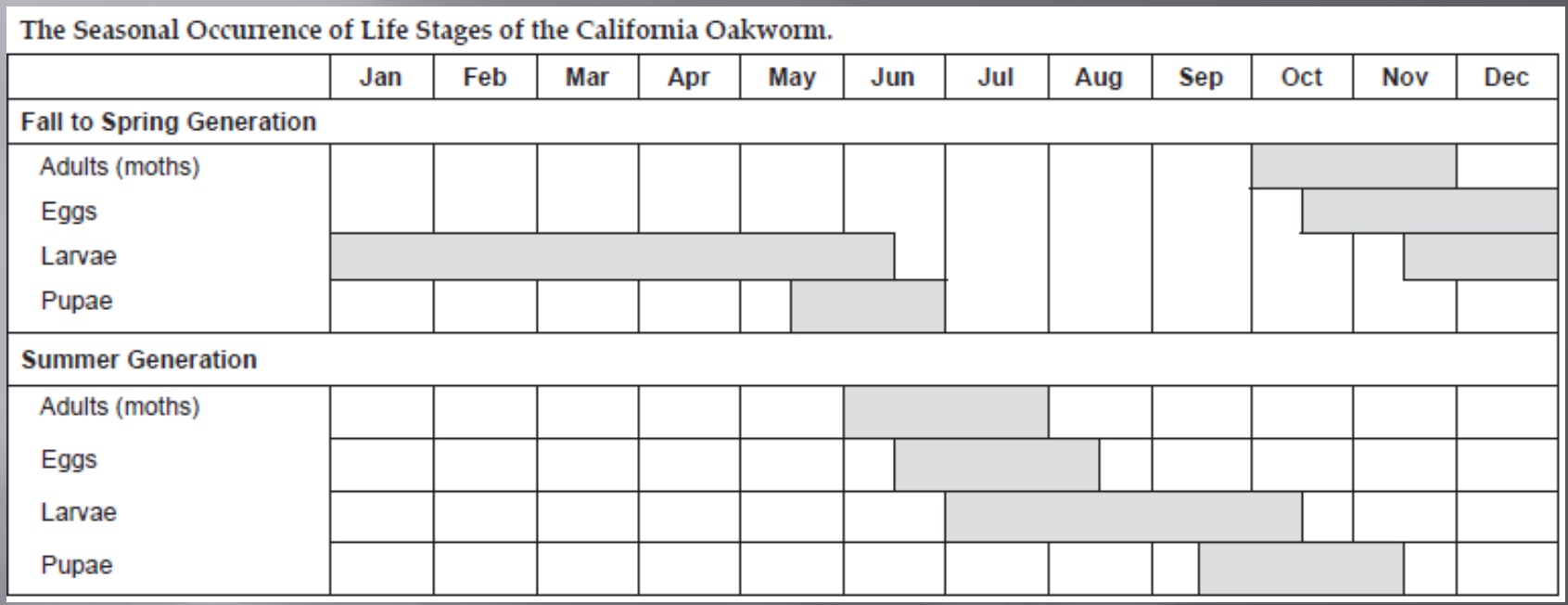
Oakworm

Seascape Uplands, September 2007

Oakworm lifestages

Oakworm lifecycle and occurence

The Seasonal Occurrence of Life Stages of the California Oakworm.



- Two generations per year
- Outbreak infestations occur irregularly, for a year or two, followed by several years of no apparent damage.

Oakworm management

- Chemical control is usually not warranted.
- Natural predators, parsatoids, and pathogens usually keep in check.
- Chemical control may be warranted if trees are already weakened or if insect populations are not tolerable.
- Chemical control: Bacillus thuringiensis (BT), Spinosad, Pyrethrins, Diflubenzuron.

California Oakworm

Integrated Pest Management for Home Gardeners and Landscape Professionals

Figure 1. California oakworm larva

The California oakworm (*Phryganidia californica*, family Dioptidae) is one of many species of caterpillars that feeds on oaks. It is the most important oak-feeding caterpillar (Fig. 1) throughout its range, which extends along the coast and through the coastal mountains of California. Damage is most common on coast live oak (*Quercus agrifolia*) in the San Francisco Bay and Monterey Bay regions. Populations vary unpredictably year to year from very high to undetectably low. Healthy oaks generally tolerate extensive loss of leaves (defoliation) without serious harm, so treatment to control oakworms usually is not recommended.

IDENTIFICATION

The adult, called an oak moth, is a uniform tan to gray or silvery color and is distinguished by its prominent wing veins. The body is about ½ inch long, and the wingspread is about 1 ¼ inches. Unlike females, males have feathery antennae.

The female lays tiny, round eggs in groups of about two or three dozen, mostly on the underside of leaves. The eggs initially are white but develop red centers that become pinkish to brownish gray before hatching into the larval stage (caterpillars).

Despite their common name, young oakworms are not wormlike but are small, yellowish green caterpillars with large, brown heads and dark stripes on their sides. Older caterpillars vary in color, commonly dark with prominent, lengthwise yellow or olive stripes.

Caterpillars range from $^1/_{10}$ inch long when newly hatched to about 1 inch when fully grown. In the pupal stage they are white, yellowish, or pinkish with black markings, ½ inch long, and suspend from limbs, leaves, trunks, or objects near trees. Inside the colorful pupal case, also called a chrysalis, the oakworm develops into a moth.

Other Leaf-eating Species. The fruittree leafroller (*Archips argyrospila*) is the most common defoliator of oaks in the warmer Central Valley of California. Larvae are green with brown or black heads and ¾ to 1 inch long at maturity (Fig. 2). When disturbed, they often wiggle vigorously and drop from leaves while suspended on silken threads. Larvae feed on buds and developing leaves, webbing them together to form a protective case. Initial damage includes leaf skeletonization. As the larvae mature, they may consume entire leaves.

Tussock moths (*Orgyia* species) and tent caterpillars (*Malacosoma* species) also feed on oaks throughout the state. Unlike the greenish, relatively smooth surface of California oakworm and fruittree leafroller larvae, tent caterpillar and tussock moth larvae are quite hairy (Figs. 3-4).

Figure 2. Fruittree leafroller larva

Figure 3. Tent caterpillar larva

Figure 4. Tussock moth larva

Pest Notes Publication 7422

University of California
Agriculture and Natural Resources

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For more information

Invasive Pests

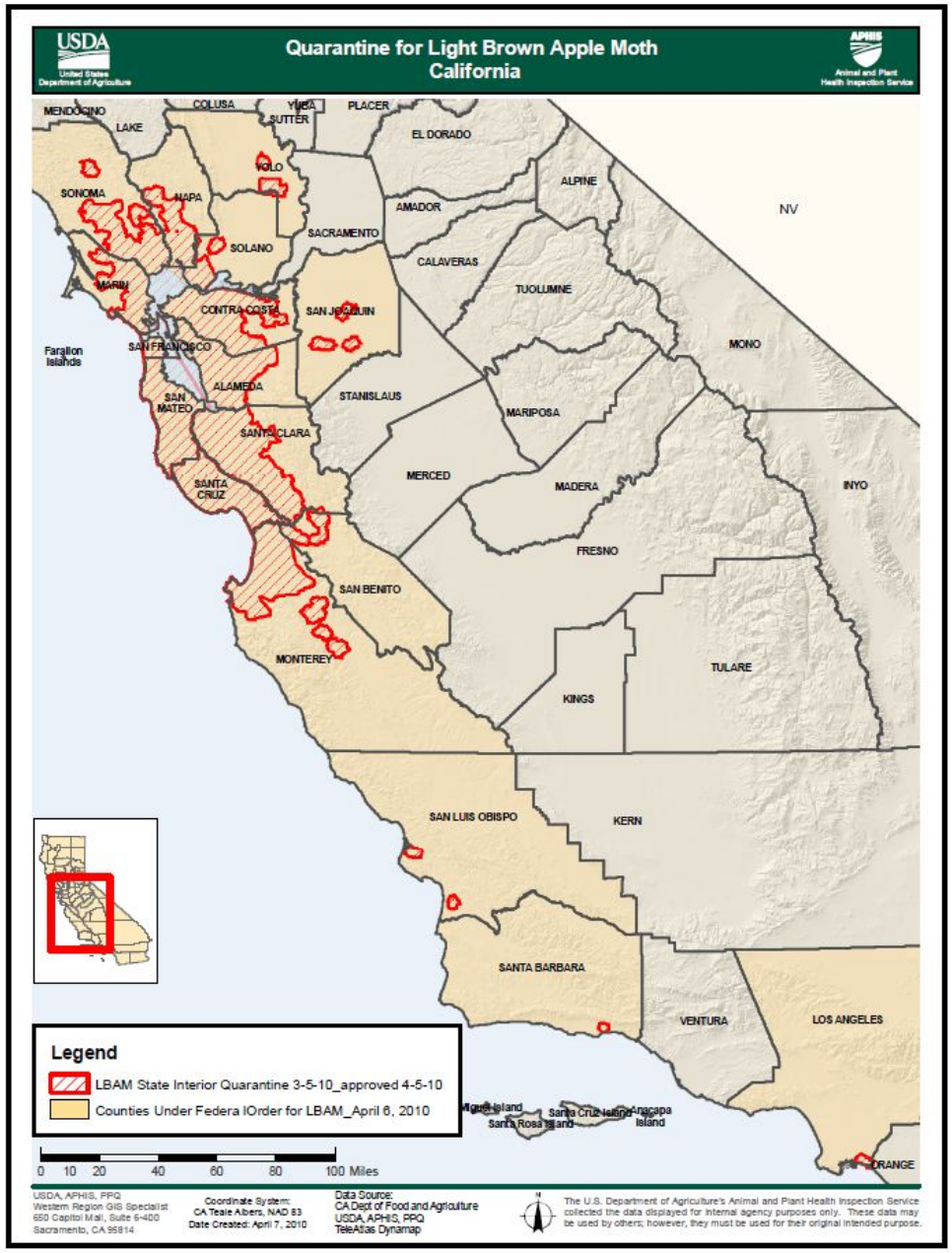
More than Light Brown Apple Moth

Light Brown Apple Moth
LBAM

A native of Australia, now a new pest introduced to California

LBAM

- First detected in Berkeley, California Feb. 2007.
- Currently found in 16 federally quarantined counties.
- Most impacted are in cooler coastal regions around the SF and Monterey Bay Areas.
- Estimated cost of control: $70,000,000 (Aug 2010)



Over 2400 square miles are under a State Interior Quarantine Feb, 2011

HOST PLANTS

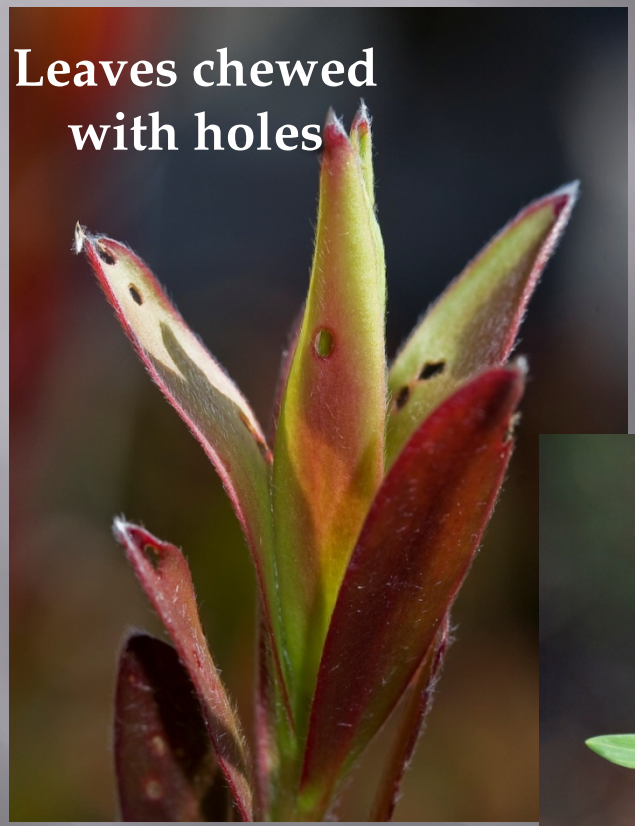
Over 250 plant species, 50 families, and 120 genera.

Adiantum sp., *Aguilegia* sp., *Amaranthus* sp., *Arbutus* sp., apple (*Malus domestica*, *Malus* spp.), apricot (*Prunus armeniaca*), *Artemesia* sp., *Astartea* sp., *Aster* sp., avocado (*Persea americana*), *Baccharis* sp., black alder/European alder (*Alnus glutinosa*), blackberry and raspberry (*Rubus* spp.), black poplar (*Populus nigra*), blueberry (*Vaccinium sp.*), *Boronia* sp., *Brassica* sp., *Breynia* sp., broad bean (*Vicia faba*), broadleaf dock (*Rumex obtusifolius*), *Bursaria* sp., butterfly bush (*Buddleia* sp.), *Calendula* sp., *Callistemon* sp., camellia (*Camellia japonica*), *Campsis* sp., capeweed (*Arctotheca calendula*), *Cassia* sp., *Ceanothus* sp., Chinese gooseberry (*Actinidia chinensis*), *Choisya* sp., chrysanthemum (*Chrysanthemum* sp.), citrus (*Citrus* spp.), *Clematis* sp., *Correa* sp., cotoneaster (*Cotoneaster* sp.), *Clerodendron* sp., clover (*Trifolium repens*, *Trifolium* sp.), *Cupressus* sp., curled dock (*Rumex crispus*), currant (*Ribes* sp.), *Cydonia* sp., *Dahlia* sp., *Datura* sp., *Daucus* sp., *Dodonaea* sp., *Eriobotrya* sp., *Eriostemon* sp., *Escallonia* sp., eucalyptus (*Eucalyptus* sp.), euonymus (*Euonymus* sp.), fat-hen (*Chenopodium album*), *Forsythia* sp., *Fortunella* sp., fox's brush (*Centranthus* spp.), *Gelsemium* sp., *Genista* sp., *Gerbera* sp., gorse (*Ulex europaeus*), grape (*Vitis vinifera*, *Vitis* sp.), *Grevillea* sp., *Hardenbergia* sp., hawthorn (*Crataegus* sp.), hebe (*Hebe* spp.), *Helichrysum* sp., hop (*Humulus lupulus*), horn of plenty (*Feijoa sellowiana*), ivy (*Hedera helix*, *Hedera* spp.), jasmine (*Jasminum* spp.), *Juglans* sp., kiwifruit (*Actinidia deliciosa*), *Lathyrus* sp., *Lavendula* sp., *Leucodendron* sp., *Leptospermum* sp., *Linus* sp., litchi (*Litchi chinensis*), *Lonicera* sp., alfalfa (*Medicago sativa*), *Lupinus* sp., *Lycopersicum* sp., *Macadamia* sp., malabar ebony (*Diospyros* sp.), *Mangifera* sp., *Melaleuca* sp., *Mentha* sp., *Mesembryanthemum* sp., *Michelia* sp., *Monotoca* sp., montbretia (*Crocosmia* sp.), *Myoporum* sp., oak (*Quercus* sp.), *Oxalis* sp., *Parthenocissus* sp., peach (*Prunus persica*), pear (*Pyrus* sp.), *Pelargonium* sp., *Persoonia* sp., *Petroselinum* sp., persimmon (*Diospyros kaki*), *Philadelphus* sp., *Photinia* sp., *Pittosporum* sp., pine (*Pinus* muricata, *P.* radiata, Pinus sp.), plantain / ribwort (*Plantago lanceolata*), *Platysace* sp., *Polygala* sp., *Polygonum* sp., poplar and cottonwood (*Populus nigra*, *Populus* sp.), potato (*Solanum tuberosum*), privet (*Ligustrum vulgare*, *Ligustrum* sp.), *Pteris* sp., *Pulcaria* sp., *Pyllanthus* sp, *Pyracantha* sp., *Ranunculus* sp., *Raphanus* sp., *Reseda* sp., raspberry and boysenberry (*Rubus idaeus*, *Rubus* sp.), rose (*Rosa* sp.), *Salvia* sp., *Senecio* sp., Scotch broom (*Cytisus scoparius*), *Sida* sp., *Sisymbrium* sp., *Smilax* sp., *Sollya* sp., St. John's wort (*Hypericum perforatum*), strawberry (*Fragaria* sp.), *Tithonia* sp., *Trema* sp., *Triglochin* sp., *Urtica* sp., *Viburnum* sp., *Vinca* sp., wattle (*Acacia* sp.), willow (*Salix* sp.).

LBAM can be introduced from surroundings

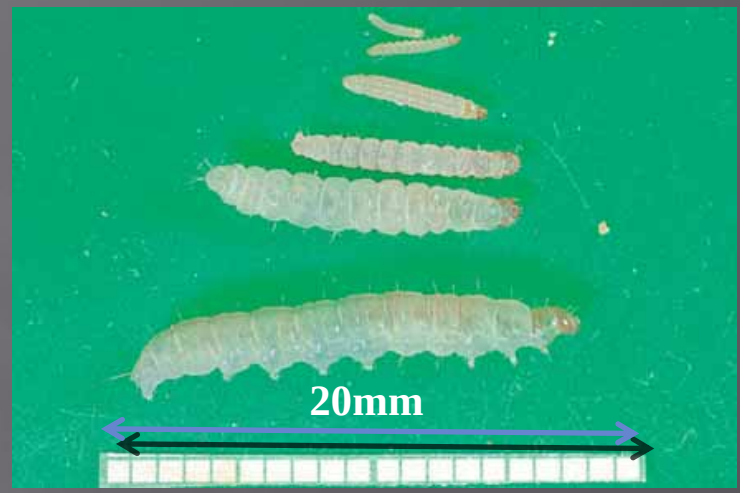
LBAM can be introduced from surroundings

Symptoms at shoot tips



Identification in Field

- Five or 6 larva instars. Range in size from 2 mm to 18 mm (up to 0.75 inch)
- Light to medium green body
- Light yellow-brown head
- Prothoracic shield (1st body segment) is light green-brown color
- White hairs and light legs.
- Body darker on top, and may have three distinct darker bands running the length of the body



http://www.winetitles.com

Many characteristics not the same from one instar to another. Characteristics more constant when larva is larger than 8 mm. DNA testing is necessary for positive identification

LBAM Management

Cultural control: weed control and hand-picking insects, inspection of plants

Insecticides

- *Bacillus thuringiensis kurstaki* (DiPel DF and others)
- Spinosyns (Conserve)
- Insect growth regulators (Intrepid)
- Pyrethroids
- Carbamates and organo-phosphates
- Horticultural oils
- Others

Biological control – parasitoids

- UC and CDFA research being conducted on parasitoids of California native leafrollers that may also parasitize LBAM.

Sterile Insect Treatment (SIT)

- USDA developing rearing facility for moths. Sterile moths are released in mass to reduce mating frequency of fertile moths.

Myoporum thrips

Another new invasive pest

Myoporum thrips

- Introduced 1995 in southern CA.
- A native to Australia or New Zealand, probably found only on Myoporum species
- In Santa Cruz County since at least 2009
- Hosts in CA: Myoporum laetum, M. debile M. parvifolium, M. insulare, and M. 'Pacificum' (a prostrate form).
- Minute pirate bug is good predator
- Chemical control with imidicloprid or spinosad
- Prune out infestation. Maintain tree health.
- Remove tree!

The thrips

The thrips

Complete metamorphosis
Tiny “fringed wing” adults
Can transmit viruses

Western Flower Thrips (WFT)

THYSANOPTERA - thrips

Complete metamorphosis
Tiny “fringed wing” adults
Rasping and sponging mouthparts

Impatiens Necrotic Spotted Wilt Virus

Greenhouse Whiteflies

Scales and mealybugs

Citrus red scale

Grape mealybug

Green Peach and Melon Aphids

Aphid Damage

- Copious amounts of honeydew, sooty mold
- Cast skins
- Distortion of new growth
- Virus transmission

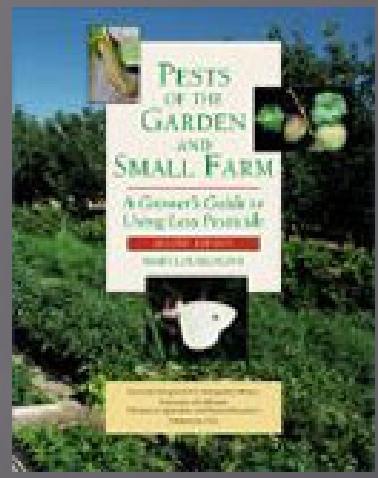
Exclusion and Sanitation

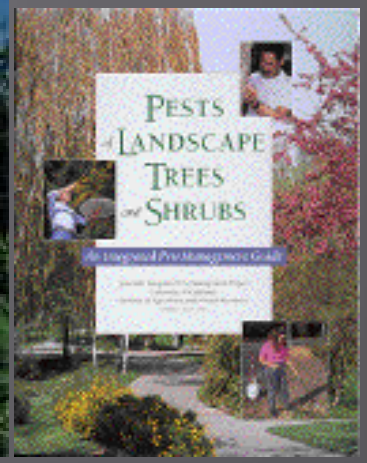
- Don’t bring home a problem
  - Examine plant and roots carefully
- Don’t keep a problem
- Weeds harbor insects and pathogens

Pesticide Applications

- Are they really needed?
- Insecticidal soaps and oils
- BT Bacillus thurengiensis (e.g. Dipel)
- Spinosad (e.g. Conserve, Entrust)
- Insect growth regulators (e.g. kinoprene)
- Multiple applications most likely needed to eradicate an established infestation
- Good spray coverage
  - top, bottom of leaves
  - surfactant to spread

References





- Traditional Hardcopy Information
  - UC publications
    - IPM manuals
    - http://ucanr.org/pubs.cfm
- Digital Information
  - UC IPM Online
  - Pest Notes
  - http://www.ipm.ucdavis.edu/

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STATEWIDE INTEGRATED PEST MANAGEMENT PROGRAM

UC IPM

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Use tools to help make decisions

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