

Managing Weeds in Landscapes

Nurseries and garden centers often sell a wide range of plants for use in gardens and landscapes. Your customers may manage a complex array of different landscape plantings, including woody trees and shrubs, woody ground cover beds, annual flower beds, herbaceous perennial beds, and mixed plantings (Figure 1). This complexity often makes weed management difficult. An integrated approach is the most economical and efficient way to control weeds, so knowing strategies for managing weeds in a variety of landscapes can help you advise customers.

Woody Trees and Shrub Beds

Control perennial weeds before planting, although weed control can also be done after planting. Densely planted areas will reduce weeds. Geotextile (landscape) fabrics rather than black plastic used with a shallow layer of mulch will keep weeds from emerging. If customers mulch without a geotextile base, the mulch layer must be thicker to prevent weed emergence.

If needed, customers can use a preemergence herbicide to control annual weeds and supplement with hand weeding and spot applications of postemergence herbicides for weeds that are not well-controlled by hand weeding, such as perennial grasses.

Woody Ground Cover Beds

Mature, woody ground cover beds should exclude most weeds; however,

when ground cover is just establishing, weed growth is likely. Perennial weeds must be controlled before planting, although perennial grasses may be selectively controlled after planting with a grass-selective herbicide like sethoxydim (Grass-Getter). Annual weeds may be controlled with mulch plus a preemergence herbicide but rooting of stolons in new plantings may be affected. Customers will need to supplement with some hand weeding.

Annual Flower Beds

A dense planting in annual flower beds will help shade out and compete with many weeds. Flower species should be carefully selected for weed management compatibility. Periodic cultivation at 3- to 4-week intervals and between flower beds plant rotations will also suppress weeds. Perennial weeds must be controlled before planting. Annual weeds can be controlled with mulches, pre-emergence herbicides, frequent cultivation, and/or hand weeding. Control perennial grasses with grass-selective herbicides like clethodim, sethoxydim, or fluazifop. Avoid nonselective herbicides in annual flower beds after planting.

Herbaceous Perennial Beds

Weed management options in herbaceous perennial beds are similar to those for annual flowers, except that it is more important to eradicate perennial weeds as there will be no opportunity to



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Figure 1. Mixed planting of woody and herbaceous perennials.

cultivate or renovate the bed for several years; and fewer species are included on herbicide labels. Geotextiles may be used in these types of plantings. Manage weeds with mulches and supplement with hand weeding. If needed, use preemergence herbicides after hand weeding.

Mixed Plantings of Woody and Herbaceous Plants

Weed management in mixed plantings is complex because of the diversity of species. Different areas of the bed could receive different weed treatments. Site preparation is critical because post-plant

... continued on page 4



Insect Pests on Citrus Trees

Citrus trees remain a popular choice for home gardeners in California, largely due to their ease of care, beauty, and functionality for food and shade. However, backyard citrus can also be plagued by pests such as psyllids, leafminers, cottony cushion scale, and mealybugs.

Longtime readers of this newsletter will know that we have covered the Asian citrus psyllid many times over the years. While the Asian citrus psyllid (ACP) is currently the most problematic pest on California citrus, there are a few other common insect pests your customers might be dealing with.

This article will briefly describe these insects, their damage, and management, and where you can find more information to help your customers manage their citrus pest problems with careful, educated practices.

Citrus Leafminer

Citrus leafminer is a moth that arrived in California in 2000 and has invaded citrus throughout the state. This small moth lays its eggs on new, succulent citrus leaves. The larvae burrow through the soft leaf tissue, creating shallow meandering tunnels, or mines (Figure 1). Larval feeding causes the leaf to curl and distort. Mature citrus trees are less frequently attacked since most of their tough leaves are resistant to the leafminer, but very young trees with their higher proportion of young, tender leaves, are more susceptible. This can slow growth of young trees but even those with heavy leafminer damage are unlikely to die.

In home landscapes, citrus leafminers are killed by many natural enemies—other insects and spiders that attack pest insects. Insecticides don't work very well on this pest because it is inside the leaves. Advise your customers to try to ignore leafminer damage since citrus can tolerate it. The leaves damaged by leafminers will continue to produce food for the tree, so they do not need to be removed. If you remove them, it will stimulate the tree to produce more new leaves, which will be attacked by the leafminer and more damage will appear.



Figure 1. Winding tunnels on a citrus leaf caused by feeding of a citrus leafminer larva.

For more information about management techniques, see the *Pest Notes: Citrus Leafminer* at ipm.ucanr.edu/PMG/PESTNOTES/pn74137.html.

What About Those Big White Bugs?

Home gardeners may bring samples of big white bugs clinging to the twigs and leaves of their citrus trees and ask for your help with identifying and managing these pests. At first glance, they may look similar but in order to have effective pest management, it's important to first determine what they are.

Mealybugs and cottony cushion scale are common pests on backyard citrus trees that can easily be mistaken for one another. Mealybugs (Figure 2) are soft, oval, wax-covered insects that feed on many plants in garden, landscape, and indoor settings. These insects suck plants juices as they feed and can produce abundant honeydew which can in turn lead to sooty mold. Mealybug feeding can also reduce tree vigor and damage fruit. Colonies of mealybugs hide in crevices so light infestations might be missed.

Mealybugs are very difficult to control with insecticides. Instead encourage your customers to conserve natural enemies by reducing ant numbers and dust. As with citrus leafminers, many natural enemies feed on and kill mealybugs. Some include common predators such as mealybug destroyers, lacewings, and spiders.



Figure 2. Mealybug colonies on citrus leaves.



Figure 3. Female cottony cushion scale with distinctive fluted, white egg sacs.

Clusters of mealybugs can be physically removed by handpicking or pruning them out. A high-pressure water spray repeated daily can also reduce populations.

The *Pest Notes: Mealybugs* contains more information about citrus mealybugs and other common mealybugs at ipm.ucanr.edu/PMG/PESTNOTES/pn74174.html.

Cottony cushion scale (Figure 3) is most easily recognized by the female's elongated, fluted white cottony egg sac which can be about 1/2 inch long. These insects can infest both citrus and some woody ornamentals. Like mealybugs, they suck plant juices and produce profuse amounts of honeydew which attracts ants and allows growth of sooty mold. Cottony cushion scale decreases the plant's health by sucking sap, and heavy infestations can cause branches to die.

In most regions of California, cottony cushion scale is well controlled by natural enemies; the red and black lady beetle

... continued on page 3

Citrus Insect Pests ... continued from p.2

called the vedalia beetle, or a parasitic fly. Insecticides don't control adult cottony cushion scale very well and may kill their natural enemies, allowing even more growth of the scale insect.

See the *Pest Notes: Cottony Cushion Scale* to learn more about this pest at ipm.ucanr.edu/PMG/PESTNOTES/pn7410.html.

Asian Citrus Psyllid

The Asian citrus psyllid, *Diaphorina citri*, is a tiny, mottled brown insect about the size of an aphid (Figure 4). This psyllid feeds on all varieties of citrus and some related ornamental plants like orange jessamine. It damages citrus leaves by feeding on new leaf growth, causing the leaves to twist or notch as they mature. More seriously than this plant damage, ACP can infect citrus trees with the bacterium *Candidatus Liberibacter asiaticus*, which causes Huanglongbing disease. Huanglongbing (or HLB) can kill a citrus tree in as little as 5 years. There is no known cure, and all commonly grown citrus varieties are susceptible to the disease.

Controlling ACP infestations is the only way to save citrus trees from this disease. To keep ACP and the disease it can carry from spreading, quarantines have been established in California. Citrus trees sold within an ACP quarantine area will have a blue or yellow tag indicating they must stay within the quarantine area.

Best Practices for ACP Within the Retail Nursery

Citrus trees in wholesale nurseries are treated with insecticides before sale but this protection only lasts for three months. In retail nurseries and garden centers, protect trees from ACP infestations by placing them inside a screened-in structure or in shaded areas of the store. This is especially important in ACP quarantine areas but is prudent in other nearby areas. It's important to know where the quarantine boundaries are, so refer to the California



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Figure 4. Asian citrus psyllid adult and eggs on young citrus leaves.

Department of Food and Agriculture (CDFA) information at cdfa.ca.gov/plant/acp/regulation.html.

As you are tending your citrus stock, carefully check for psyllids. Be sure to inspect trees whenever new leaves are forming on the trees. If you see ACP in the retail setting, contact your county agricultural commissioner as soon as possible.

See the recently revised *Pest Notes: Asian Citrus Psyllid and Huanglongbing Disease* for more information on identification and management at ipm.ucanr.edu/PMG/PESTNOTES/pn74155.html.

Best Practices for ACP in the Home Garden

Once your customers purchase citrus trees, let them know how they can minimize spread of the ACP and HLB disease from their garden. They should be sure to plant the trees locally. Home gardeners should treat for ACP and control ants on their citrus trees. Anyone growing citrus trees must watch for HLB symptoms and if they suspect that a tree is



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Figure 5. Ants harvesting honeydew from Asian citrus psyllid nymphs.

infected, they must report it to their county agricultural commissioner's office or call the CDFA Exotic Pest Hotline at 1-800-491-1899. Home gardeners need to support ACP treatments and removal of HLB-infected trees if they are in an area with HLB.

Ant Control

Most citrus tree problems in home gardens can be solved by pruning the trees to allow better air flow and by controlling ants. Ants collect the honeydew produced by Asian citrus psyllid nymphs, mealybugs and cottony cushion scale to feed their colonies (Figure 5). To protect this honeydew food source, ants guard the pest insects from natural predators and parasites that help control pest populations.

To improve biological control, home gardeners should keep ants out of trees and shrubs by banding the trunks with sticky substances such as Tanglefoot or by using ant baits. Young trunks should be protected from possible injury by wrapping the trunk with a collar of duct tape or fabric tree wrap and coating this with the sticky material. The sticky material must be checked every week or two and stirred with a stick to prevent the material from becoming covered with debris that ants can cross. Branches must be pruned to prevent ants from using them to gain access to the tree. Placing ant stakes or liquid baits at the base of the tree is an effective and less labor intensive way to control ants.

For more details about these and many other citrus pests, visit the Citrus page on the UC IPM home and garden website at ipm.ucanr.edu/PMG/menu_homegarden.html. Consider printing a copy of these free pest publications so you can show customers photos and where they can go to find out more.

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WHAT IS IPM? Integrated Pest Management (IPM) programs focus on long-term prevention of pests or their damage through a combination of techniques including resistant plant varieties, biological control, physical or mechanical control, and modification of gardening and home maintenance practices to reduce conditions favorable for pests. Pesticides are part of IPM programs but are used only when needed. Products are selected and applied in a manner that minimizes risks to human health, beneficial and nontarget organisms, and the environment.

Landscape Weeds ... continued from p.1

herbicide choices are few. Plant the woody species first and control perennial weeds in the first two growing seasons, then introduce the herbaceous species. Plant close together to shade the soil. Group plants within the bed that will receive similar weed management programs.

In most landscape situations, herbicides should not normally be needed by home gardeners. Mulching, removal

by hand, and proper irrigation (pattern and amount of water) are sufficient in most cases. Find more information in the newly revised *Pest Notes: Weed Management in Landscapes* at ipm.ucanr.edu/PMG/PESTNOTES/pn7441.html.

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Pesticide Briefs: What Do These Terms Mean?

In our Summer 2018 newsletter, we defined what a pesticide is and gave a few examples. Now, we will explain some pesticide types and other jargon to help readers understand some of the terminology used when referring to pesticides.

There are many different types of pesticides, each is meant to be effective against specific pests. The term “-cide” comes from the Latin word “to kill.”

- **Algaecides** are used for killing and/or slowing the growth of algae.
- **Antimicrobials** and **Disinfectants** control germs and microbes such as bacteria and viruses.
- **Desiccants** are used to dry up living plant tissues.
- **Defoliants** cause plants to drop their leaves.

- **Fungicides** are used to control fungal problems like molds, mildew, and rust.
- **Herbicides** kill or inhibit the growth of unwanted plants, aka weeds.
- **Insecticides** are used to control insects.
- **Insect Growth Regulators** disrupt the growth and reproduction of insects.
- **Miticides** control mites that feed on plants and animals. Mites are not insects.
- **Molluscicides** are designed to control slugs, snails and other molluscs.
- **Mothballs** are insecticides used to kill fabric pests by fumigation in sealed containers.
- **Pheromones** are biologically active chemicals used to attract insects or disrupt their

mating behavior. The ratio of chemicals in the mixture is often species-specific.

- **Plant Growth Regulators** are used to alter the growth of plants. For example, they may induce or delay flowering.
- **Repellents** are designed to repel unwanted pests, often by taste or smell.
- **Rodenticides** are used to kill rodents like mice, rats, and gophers.
- **Synergists** make certain pesticides more effective, but they are not effective when used alone.
- **Wood Preservatives** are used to make wood resistant to insects, fungus and other pests.

—Courtesy of the National Pesticide Information Center, npic.orst.edu.
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