Information for pest management professionals and pesticide applicators

UC IPM Green Bulletin

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Victorian Box (*Pittosporum undulatum*) Decline

Victorian box (*Pittosporum undulatum*) is an evergreen tree native to Australia that grows moderately fast to about 50 feet high and wide. It was much planted as an ornamental landscape subject in the first half of the 20th century in coastal central and southern California, especially from Santa Barbara to San Diego, where it was used as a lawn or street tree, background, screen, or informal hedge, and prized for its dense canopy, attractive and glossy green foliage, fragrant white flowers, showy orange fruits, and ease of cultivation (Figure 1). Indeed, from late January through March, especially in the evening, one can detect the wonderful, sweet, somewhat citrus-like fragrance of its flowers wafting through the air in older neighborhoods. Victorian box has somewhat fallen out of favor as a landscape subject in the last 40 years but is still found in nurseries and as old and young plants in the landscape. Typically a vigorous grower, trunks can attain one to two feet in diameter; and the tree can produce copious amounts of fruits, which readily germinate and produce seedlings in irrigated landscapes.

Over the last 25 years, arborists, horticulturists, landscape managers, and others have frequently noticed a widespread decline of older, established Victorian box trees in Southern California. Affected trees tend to lose vigor gradually but steadily; canopies thin; leaves yellow, die, and drop; and twigs and branches die back, either generally over the whole tree or, at least initially, restricted to one or more branches (Figure 2).

What Causes the Decline?

The exact cause of the decline is unknown but is commonly associated with a combination of improper cultivation, old age, and possibly one or more opportunistic pathogens. Improper cultivation, such as too much or too little water, soil compaction, excessive and/or inappropriate pruning, root disturbance or damage, wounds, and competition from adjacent encroaching plants, could stress trees and predispose them to opportunistic pathogens. Because most of the trees exhibiting this decline are old and mature, perhaps overly so, natural senescence is likely a significant contributing factor; rarely are young, small trees, which are usually vigorously growing, showing symptoms. Symptoms generally indicate root damage or death, but isolating soil-borne root pathogens associated with the decline has been difficult and mostly inconclusive. While *Phytophthora*, *Armillaria*, *Fusicoccum*, and *Botryodiplodia* have been isolated

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Figure. 1. This healthy Victorian box **(Pittosporum undulatum)** *tree exhibits a dense canopy, glossy green foliage, and fragrant white flowers, making it an attractive landscape subject.*
(D. R. Hodel, UCCE, Los Angeles)

Figure. 2. Victorian Box trees with decline tend to lose vigor gradually but steadily; canopies thin; leaves yellow, die, and drop; and twigs and branches die back, either generally over the whole tree or on just one or more branches.
(D. R. Hodel, UCCE, Los Angeles)

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Victorian Box Decline

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from some declining Victorian box trees, these pathogens are not thought to be the sole or even primary causal agents responsible for the decline. Thus, a combination of factors, including old age, improper cultivation, and several disease pathogens, is likely responsible for the decline.

Provide Proper Cultural Care

The best management strategy for Victorian box decline is prevention through proper culture. When planting a Victorian box, select the right location in the garden or landscape; and plant and care for it properly. Irrigate appropriately, applying sufficient water at each irrigation event to moisten the upper 12 inches of soil. Irrigate again only when the soil one to two inches deep becomes dry, then irrigate once again to moisten the upper 12 inches of soil. This irrigation strategy allows for a slight dry down between irrigation events and encourages a deeper and healthier root system. Avoid disturbing or wounding the roots or compacting the soil; maintain a one- to two-inch layer of mulch (fallen leaves, grass clippings, etc.) over the root zone and six inches from the trunk. Prune only to remove dead branches or to maintain good structure, and when doing so adhere to sound and appropriate pruning practices. Keep encroaching turf grass, groundcovers, shrubs, and weeds at least three feet away from the trunk. Prune back adjacent trees encroaching or overtopping the Victorian box's canopy. Remember that old trees seem more susceptible to the decline, so where practical consider replacing senescing trees with an appropriate species and individual tree.

What about Chemical Control?

There is no proven chemical treatment for declining trees. However, applications of gypsum (calcium sulfate) at the rate of 10 pounds per 100 square feet might help to suppress some root pathogens that may be present.

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Need continuing education by the end of the year?

See the online courses on the UC IPM web site:

http://www.ipm.ucanr.edu/training/

Thousand Cankers Disease of Walnuts

For at least a decade, thousand cankers disease (TCD) has been killing walnut trees across California wildlands and landscapes. The causative agent is a yeast-like fungus (*Geosmithia morbida*) spread by a tiny native beetle called the walnut twig beetle (*Pityophthorus juglandis*) (Figure 1). TCD has killed thousands of walnut trees and threatens not only ornamental and landscape trees but also English walnut trees in commercial orchards. Once a tree becomes infected no control is available; therefore, it is critically important that practicing arborists and landscapers be aware of this disease and not move any infested wood. The minute beetles can hide and survive beneath the bark in dry walnut wood; they may emerge later and transmit the disease to other walnut trees.

Hosts

Known hosts include walnuts (*Juglans* species) and wingnuts (*Pterocarya* species). In California the disease has been observed on both native species of black walnut, *Juglans californica* and *J. hindsii,* and both are quite susceptible. English walnut, *J. regia*, is affected to a lesser degree but is typically grown grafted on a hybrid rootstock, which is susceptible, so symptoms of the disease may be observed in walnut orchards as well. The eastern black walnut, *Juglans nigra*, is highly susceptible. Although of limited importance and distribution in California, this species is grown in eastern North America for its excellent wood and in much of western North America as a shade tree. Therefore, TCD represents a threat throughout most of the United States. Eastern black walnut appears to have been the key host species that provided for the range expansion of the disease in most of the western states.Wingnut, a less frequently planted tree in California landscapes, is also susceptible to the disease.

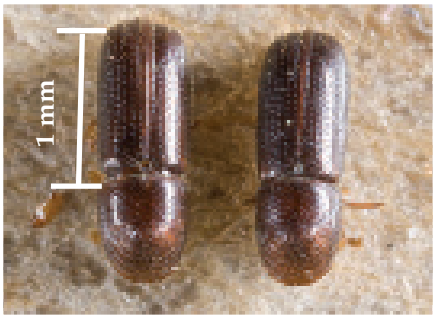

Figure. 1. Walnut twig beetles are tiny, about 1.5 mm in length.
(L. Strand, UC IPM)

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Thousand Cankers Disease

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Symptoms and Signs

On small branches (but not on twigs less than about 1 cm in diameter), a set of pinhole-sized beetle entrance and exit holes can be found. Each entrance hole is close to, or surrounded by, a dark wet or oozing canker (especially prominent on the smooth bark of the English walnut) (Figure 2). The holes are just large enough to accommodate the tip of a mechanical pencil. The attacks of many beetles result in hundreds of dark lesions so numerous that they coalesce, girdling and killing the branch, and giving rise to the disease name. If the bark is removed, small beetle galleries in necrotic (dead) areas of phloem comprise the cankers (Figure 3). From a distance, the affected tree will show dieback of branches beginning at the top and spreading downward ("branch flagging and crown dieback"). As the crown is gradually killed, epicormic branches may sprout from the trunk. Eventually, the walnut twig beetles attack the main stem and colonize the phloem. These attacks can go right to the soil line in the trunk.

How is It Controlled?

Currently, no insecticides or fungicides have been shown to save trees affected with TCD. Thus, it is important that infested wood is not moved off site. Infested trees should be taken down and ground or burned (where allowed) on site. Because the beetles are very small and difficult to detect, it is important that freshly cut walnut branches, logs, or burls not be moved or shipped from infested areas, not even for woodworking purposes. Seasoning wood on site for 2-3 years should allow walnut twig beetles and other woodborers time to emerge at the site of infestation, but it is prudent to have all wood inspected by a knowledgeable entomologist or cooperative extension specialist prior to movement of the material from the site, even when properly seasoned and de-barked.

For more information, visit the UC IPM web page on Thousand Cankers disease at http://www.ipm.ucanr.edu/PMG/menu.thousandcankers.html.

Figure. 2. Dark staining of black walnut bark around the entrance and exit holes made by walnut twig beetle.
(L. Strand, UC IPM)

Figure. 3. Dead phloem beneath the surface of black walnut bark.
(L. Strand, UC IPM)

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Pest Note Updates

UC IPM recently released four revised titles in its Pest Notes series of publications covering home, garden, landscape, and wildlife pests.

Lawn Insects
http://www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7476.html

Scales
http://www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7408.html

Hackberry Woolly Aphid
http://www.ipm.ucdavis.edu/PMG/PESTNOTES/pn74111.html

Drywood Termites
http://www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7440.html

View these revised pest notes and the 165 other titles on our web site at www.ipm.ucanr.edu/PDF/PESTNOTES/index.html.

Asian Citrus Psyllid is Spreading in California

In August 2012, we wrote about the Asian citrus psyllid (ACP) in UC IPM's Green Bulletin newsletter (http://www.ipm.ucdavis.edu/PDF/PUBS/greenbulletin.2012.aug.pdf). At that time, ACP was found only in San Diego, Imperial, Riverside, San Bernardino, Los Angeles, and Orange counties. It has since been detected in Ventura, Santa Barbara, San Luis Obispo, Fresno, Kern, and Tulare counties, and in the last three months has been found in San Joaquin and Santa Clara counties (Figure 1).

Because ACP can transmit the bacterium causing the most devastating disease of citrus in the world, huanglongbing (HLB) or citrus greening, it is imperative that this pest be managed as intensely as possible (Figure 2). To keep the psyllid from spreading further, ACP host plants (citrus and close relatives) in all or part of these counties are under quarantine and cannot be moved out of the quarantine area.

We cannot stress strongly enough that landscape professionals, including residential and maintenance gardeners, can play a major role in minimizing the spread of this pest or HLB. To build upon the information from 2012:

- Always purchase citrus trees from a reputable nursery that sells certified disease-free trees.
- Uncertified trees may provide the insects with a source of disease they can pass on to other trees!
- Be careful not to move any citrus trees out of the quarantine area to uninfested areas. If you purchase a citrus plant from a nursery that is within an ACP quarantine area, it will have a blue or yellow tag on it that requires the plant to stay within the quarantine area. Purchase plants close to where you plan to plant them!

Figure 1. Asian citrus psyllid adult, and white wax tubules from yellowish nymphs. (M. E. Rogers, University of Florida)

Figure 2. Mottling and yellowing of orange foliage that crosses leaf veins, a symptom of citrus greening (Huanglongbing). (M. E. Rogers, University of Florida)

- As you are planting or caring for citrus, carefully check the leaves and stems for psyllids. See these web sites for photos of the pest: http://www.CaliforniaCitrusThreat.org or http://www.PeligranCitrusenCalifornia.com. If you or your customer suspects you have seen the pest or disease, immediately call the CDFA Hotline 1-800-491-1899. When you report the psyllid, CDFA personnel will tell you if they will be treating the reported trees or if you are to manage the ACP population yourself.
- Consult the UC IPM Asian Citrus Psyllid Pest Note for information about how you can help in the effort to control psyllids: http://www.ipm.ucdavis.edu/PMG/PESTNOTES/pn74155.html.
- It is very important to know if you are in an ACP infested area and; if you are, to handle green waste carefully. If you are pruning citrus or other ACP hosts, double bag prunings before transporting them to avoid moving ACP to new areas.
- Educate your clients to dry out their clippings before placing them in green waste bins to avoid spreading ACP.
- If you think you have seen the disease, CDFA personnel will take leaf samples to confirm infection of the tree by a biochemical test; and if the infection is found, regulatory actions such as tree removal will take place.

Be vigilant and help to protect California's citrus trees!

Find out more information and see official quarantine rules at: http://www.cdfa.ca.gov/plant/pe/interiorexclusion/acp_quarantine.html.

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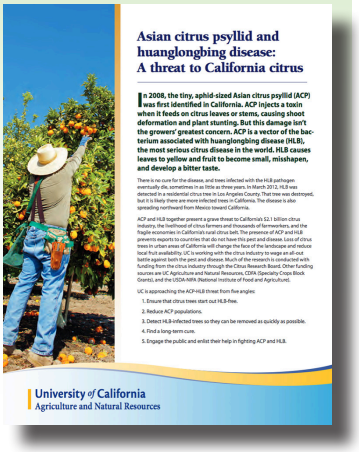
WHAT IS IPM? Integrated Pest Management (IPM) programs focus on long-term prevention of pests or their damage through a combination of techniques including resistant plant varieties, biological control, physical or mechanical control, and modification of gardening and home maintenance practices to reduce 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.

Ask the Expert!

Q **What is being done to help reduce the impact of ACP and HLB?**

A The University of California is working with the citrus industry and others to limit the spread and impact of both the pest and disease. Here are just a few items of interest:

- The map located at http://ucanr.edu/sites/acp shows where Tamarixia wasp parasites have been released by UC Riverside's Dr. Mark Hoddle's lab and/or spread in Southern California. This parasite is rapidly expanding its range and will help to reduce ACP populations in the urban areas.
- Researchers at UC Davis and UC Riverside are working to develop methods to detect HLB early in its infection, so that infected trees can be promptly removed.
- Researchers in Florida are working on developing HLB tolerant rootstocks and/or using genetic engineering to protect citrus trees from the disease.



Find out more about what the University of California researchers and experts are doing to control ACP and HLB in California at http://ucanr.edu/files/158106.pdf .

Check out our UC IPM Blog!

Our blog provides a one-stop site for UC IPM news related to pests of homes, gardens, landscapes, and structures. We post articles from our newsletters as well as announce new and revised Pest Notes and other new educational materials or activities of interest to urban and residential audiences.

View or subscribe to the blog at: ucanr.edu/blogs/ucipmurbanpests/

POSITION VACANCY

Title: Area Integrated Pest Management Advisor

Location: Los Angeles County

Deadline to apply: January 3, 2015

Visit http://ucanr.edu/Jobs/Jobs_990/?jobnum=695 for information and application instructions.

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For more information about managing pests, contact your University of California Cooperative Extension office listed under the county government pages of your phone book, or visit the UC IPM Web site at www.ipm.ucanr.edu.