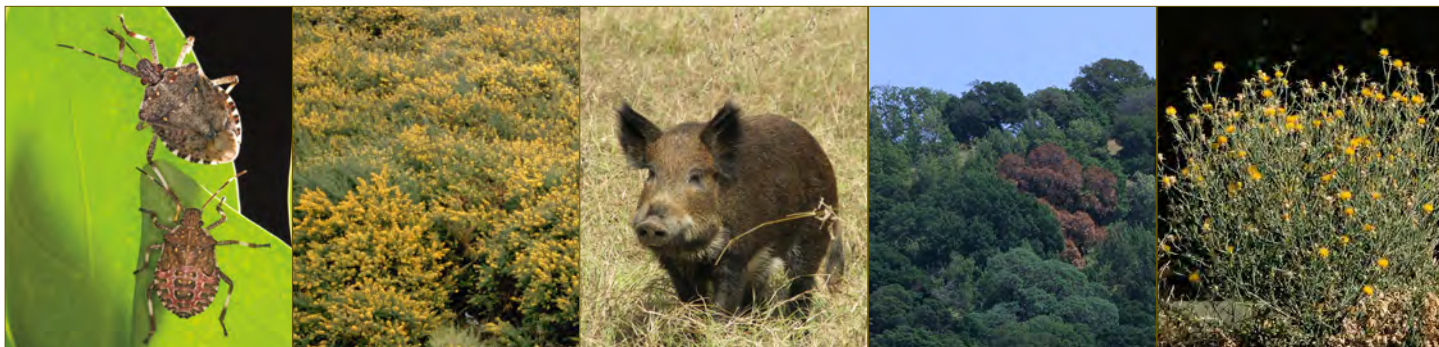


## Stop the Spread of Invasive Pests



Invasive pests threaten California's natural environments, agricultural production, structures, landscapes, and gardens, causing billions of dollars of damage to our agricultural systems and natural areas each year.

Throughout history, humans have moved plants and animals around the globe, bringing them from their native lands to new settlements. In California, some introductions did unexpected damage while others, such as food crops, had positive outcomes. New species are often intentionally introduced, although numerous exotic species arrive in products brought into California accidentally by travelers or shipped in commercial trade. Many invasive plant problems began as ornamental plants for sale by nurseries and garden centers. Exotic and invasive plants are still available in commercial nurseries.

There are many invasive pests of major concern in California, such as the white garden snail (see page 2), spotted lanternfly (see page 3), nutria, wild pig, brown marmorated stink bug (BMSB),

and various species of weeds. Some of the worst invasive plants in California, brooms and yellow starthistle, have caused substantial changes to California's wildlands. The pathogen that causes sudden oak death was inadvertently introduced to California forests on nursery stock and is estimated to have killed more than 1 million oak and tanoak trees during the last decade. Insect-carried diseases such as West Nile virus and others threaten public health, horses, and native birds.

### *What can you do about invasive pests?*

Here are some tips and resources that you can use to help stop or slow the spread and introduction of invasive pests.

- Don't plant or release invasive plants into the environment. Also, avoid dumping aquatic plants or aquarium water into local waters, since many aquarium plants are highly invasive.
- Use plants native to your area for landscaping.

- Don't bring foreign plant or animal material into California.
- Be careful when moving firewood.
- Learn to identify invasive species new to California.
- Report invasive species in your area! Contact your local UC Cooperative Extension office or Agricultural Commissioner to report invasives and to get information on controlling invasive species on your property.

For more information and resources on invasive pests, visit the UC IPM Invasive and Exotic Pests page at [www2.ipm.ucanr.edu/Invasive-and-Exotic-Pests/What-are-exotic-and-invasive-pests/](http://www2.ipm.ucanr.edu/Invasive-and-Exotic-Pests/What-are-exotic-and-invasive-pests/).

—Karey Windbiel-Rojas, Associate Director, Urban and Community IPM, UC Statewide IPM Program, [kwindbiel@ucanr.edu](mailto:kwindbiel@ucanr.edu)

Photo credits, l to r: Brown marmorated stink bug (S Ausmus); French broom (B Rice); wild pig (B Higginbotham); sudden oak death (Jack Kelly Clark); yellow starthistle (JD Ditomaso).

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# The White Garden Snail: A Serious Threat to Landscape Ornamentals?

The white garden snail (*Theba pisana*), sometimes known as the Italian white snail, can be a serious pest of landscape ornamentals, including trees, shrubs, groundcovers, and herbaceous plants (Figure 1). Although it has been established in California for at least 100 years, it has mostly been inactive but has recently become more active in southern California and in coastal San Mateo County. If this activity continues to increase, the white garden snail will become a major pest and do serious harm to landscape plants, especially in coastal California.

## Damage and Signs

The white garden snail feeds on an unusually broad range of plants, including orchard trees, vegetables, and ornamentals. Feeding damage is typical snail and slug damage. It makes irregular holes with smooth edges primarily on leaves or on the margins of leaves and on flowers (Figure 2). It also feeds on seedlings, ripening fruits, and young plant bark. Because this snail has an exceedingly high reproductive rate and thousands can gather on one tree, severe defoliation and eventual death are possible, making it a major pest. Pests such as earwigs, caterpillars, and other chewing insects can cause similar damage but will not produce the telltale silvery mucous trails of the white garden snail.

## Identification and Biology

The shell of this snail is unusually variable in appearance, especially in the dark bands and other markings. The adult has a medium-sized shell about the size of a nickel or dime (Figure 3). The non-glossy shell is typically ivory white (rarely pink), but can be light beige with narrow, dark brown bands. A similar



Figure 1. The white garden snail estivating on stems of *Pimpinella anisum*.

looking but much less damaging snail, the milk snail (*Otala lactea*), sometimes occurs with the white garden snail and can be confused with it. The milk snail tends to be larger, up to 1.2 inches in diameter, and the inside of the thick opening is dark.

Unlike most snails and slugs, the white garden snail climbs and rests in a dormant state (estivates) on the cooler and least wind-exposed sides of vertical surfaces like trees, shrubs, fences, posts, and walls during the hot, dry season. They can survive for long periods by forming a wall of dry mucus to seal the shell opening and reduce water loss. They typically congregate in great numbers in an exposed, conspicuous manner to “ride out” the hot, dry season until the return of more suitable conditions in the fall.

After the first rains of the season, usually in November in California, the white garden snail, which are cross-fertilizing hermaphrodites, become more active, mate, and descend to the ground from their estivation sites to lay eggs and



Figure 2. Feeding white garden snails truncated the tips of this *Senecio serpens*.

forage. They deposit eggs just under the soil surface or in humus. Hatching usually occurs after 20 days. This snail has a relatively short life span of 1 to 2 years, breeds only over a single season, and produces a large number of eggs (over 4,500 eggs per pair).

## Management

Control of the white garden snail can be time-consuming, difficult, and costly because they have a high reproductive rate, they climb high on objects, and they estivate for long periods. Effective management of this snail must rely on a combination of methods, including exclusion, early detection, and a variety of treatments.

Like most land snails, they move slowly so in order to reach new areas, they must be aided by people. To exclude the white garden snail from your area carefully check crates, boxes, and plants shipped from infested areas. To detect this snail, search plants, fences, posts, walls, and other vertical surfaces.

Measures used to manage other snails, such as sprays, baits, traps, and barriers, are only effective when the white garden snail is active and foraging on or near the ground. However, unlike other snails, this snail estivates in the open where they are visible and conspicuous, perhaps offering the best opportunity for their control; thus, hand-picking, knocking down, and then sweeping or vacuuming might be the best option, especially with limited infestations or in

... continued on page 3

### Word of Caution

Use rubber or latex gloves when picking or handling snails and vegetation with their slime trails, and wash hands thoroughly afterwards. Snails and slugs are intermediate hosts of rat lungworm disease, which is likely present but not yet officially detected in California. Rat lungworm disease is caused by a parasitic nematode that can attack the human brain and spinal cord if ingested.

# Keep an Eye Out for the Spotted Lanternfly

The spotted lanternfly (*Lycorma delicatula*) is a new exotic pest that was first detected in Pennsylvania in 2014 and has since moved to other nearby states (Figure 1). Everyone, including home gardeners and retail nursery and garden center employees, can play a significant role in keeping this exotic pest out of California by being the eyes and ears needed for early detection.



Figure 1. Adult spotted lanternfly with wings spread.

The spotted lanternfly is a sizable planthopper insect which is about 1 inch long and 0.5 inch wide (Figure 2). It originates from northern China and can also be found in Vietnam, Japan, and South Korea. This planthopper has a wide host range consisting of more than 70 plant species with at least 40 of the known hosts occurring in North America. This insect causes economic damage to grapevines and also feeds on fruit trees, hops, and woody ornamentals. Its preferred host is the invasive tree of heaven (*Ailanthus altissima*). Spotted lanternflies have piercing-sucking mouthparts and produce a copious amount of honeydew that enables the growth of sooty molds. In addition to being an agricultural and horticultural pest, the spotted lanternfly can also be a nuisance pest in urban areas due to their aggregation behavior (Figure 3).



Figure 2. Side view of the adult spotted lanternfly.

Each female produces one to two egg masses of 30 to 50 eggs each. Seedlike eggs are laid in multiple successive rows and covered with a yellowish-brown waxy deposit (Figure 4). The first three immature stages are black with white spots and lack wings. The fourth immature stage is red and black with white spots and have small wing pads (Figure 5).

Adults have a stout yellow abdomen with incomplete black bands and two sets of wings: the forewings and the hindwings.

The forewings are a creamy beige with black spots changing to small black rectangles toward the tips. The hindwings are primarily black and red, with black spots appearing in the red portions. The hindwings are not noticeable when at rest (Figure 6). Adults tend to hop when moving instead of flying.

... continued on page 4

## White Garden Snail ...continued from page 2



Figure 3. The adult white garden snail has a medium-sized shell about the size of a nickel or dime.

small landscapes. Because it can estivate in vacant fields or untended areas adjacent to landscape sites, these untended areas should be carefully checked and mowed.

For extensive details on the various management methods for the white garden snail, including habitat modification, biological control, hand-picking, and chemical control, see the full article at Hodel Palms and Trees: [ucanr.edu/sites/HodelPalmsTrees/](http://ucanr.edu/sites/HodelPalmsTrees/)

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# Spotted Lanternfly *...continued from page 3*

The spotted lanternfly can negatively affect high value commodity crops in California if it were to become established. In a proactive response to this possibility, researchers at UC Berkeley and UC Riverside are testing biological control agents for this insect.

Since the tree of heaven is the preferred host of the adult spotted lanternfly, these trees can be monitored for presence of the insect. If you suspect you have found this insect, report your sighting to your local county Agricultural Commissioner's office right away. Document the exact location of the finding. Collect the insect in a sealable container you can deliver to the office or take clear photographs of the suspected spotted lanternfly. Nymphs cannot fly and adults do not readily fly away when approached so you can easily collect both. Early detection is key and together, we can all play a role in keeping the spotted lanternfly from establishing in California.

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Figure 3. Aggregation of adult spotted lanternflies in an urban area.



Figure 4. Spotted lanternfly eggs covered with waxy deposits (left); seed-like eggs with holes where spotted lanternfly nymphs have emerged (right).



Figure 5. The first three immature stages of the spotted lanternfly are black with white spots (left); the fourth immature stage is red and black with white spots (right).



Figure 6. The fourth immature stage and adults of the spotted lanternfly.

# Carbaryl Products Now Restricted Use in California



Products containing carbaryl, like some Sevin products, won't be sold in retail nurseries and garden centers.

Starting August 1, 2020, all pesticides containing the active ingredient carbaryl will be designated as restricted materials in California, except for baits labeled only for agricultural use.

Once this regulation goes into effect, only licensed pesticide dealers can sell restricted carbaryl products and only licensed pesticide applicators will be allowed to purchase and use pesticides containing carbaryl.

After August 1, 2020 it will be unlawful to possess or use carbaryl products without an appropriate pesticide applicator license and permit. This includes home gardeners and maintenance gardeners (if they are not licensed to apply pesticides). There will not be a sell-through period for existing products on retail shelves following the effective date.

Consumers should contact their state or local hazardous waste disposal program or local solid waste collection service for proper disposal of unused products and containers. It is illegal to dispose of carbaryl products in sinks, toilets, storm drains, or any body of water.

For more information, see the California Department of Pesticide Regulation pages at <https://www.cdpr.ca.gov/docs/pressrls/2020/072720.htm>.

**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.

# Revised *Pest Notes*

What did you think about this newsletter?  
We want your feedback!  
<https://bit.ly/32CYJqt>



## Anthracnose

The fungal disease anthracnose infects many trees and shrubs. See *Pest Notes: Anthracnose*, recently revised by UC Cooperative Extension advisors Jim Downer and Steven Swain, and Amanda Crump of UC Davis Plant Sciences, for a list of anthracnose-resistant trees,

information about the life cycle and dissemination of anthracnose-causing fungi, and an updated chemical control section.

[ipm.ucanr.edu/PMG/PESTNOTES/pn74147.html](http://ipm.ucanr.edu/PMG/PESTNOTES/pn74147.html)



## Head Lice

Many families with young children have at least one encounter with head lice but finding effective and safe ways to manage these pests can be difficult. Authors Victoria Leonard of UC San Francisco and Dawn Gouge of University of Arizona bring their public health and pest management expertise to the

updated *Pest Notes: Head Lice*, providing easy, safe, and effective ways to control a head lice infestation.

[ipm.ucanr.edu/PMG/PESTNOTES/pn7446.html](http://ipm.ucanr.edu/PMG/PESTNOTES/pn7446.html)



## Brooms

In the newly revised *Pest Notes: Brooms*, UCCE advisor Scott Oneto and UC Davis weed scientist Joe DiTomaso explain the issues with planting the invasive weeds called brooms. This publication includes expanded and updated sections on biology, management and herbicides recommended for control. Effective application techniques are detailed with new illustrative photographs.

[ipm.ucanr.edu/PMG/PESTNOTES/pn74147.html](http://ipm.ucanr.edu/PMG/PESTNOTES/pn74147.html)

Visit UC IPM's *Pest Notes* web page for these and many more titles  
[ipm.ucanr.edu/PMG/PESTNOTES](http://ipm.ucanr.edu/PMG/PESTNOTES)



## Pests in the Urban Landscape Blog

Check out the UC IPM urban pest management blog!  
Get timely information about pests in and around homes, gardens, landscapes, and structures in California.  
[ucanr.edu/blogs/ucipmurbanpests](http://ucanr.edu/blogs/ucipmurbanpests)

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For more information about managing pests, contact your University of California Cooperative Extension office, or visit the UC IPM website at [ipm.ucanr.edu](http://ipm.ucanr.edu)

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