



University of California
Agriculture and Natural Resources

Green Bulletin

Vol. 10 No. 3 Summer 2020

Keep a Look Out for the Spotted Lanternfly

Invasive species have potential to cause high levels of economic damage when introduced into new environments because of the lack of natural enemies that normally suppress populations in native environments. Travel and commerce are ideal avenues for introduction of exotic pests into new areas. Therefore, the identification and early detection of exotic pests are crucial to preventing their establishment in California. Everyone can play an important role in keeping exotic pests out by being the eyes and ears needed for early detection.

What is the spotted lanternfly?

The spotted lanternfly, *Lycorma delicatula* (Figure 1), is an exotic pest, new to the United States, that was first detected in Pennsylvania in 2014. It was later found in New York and Delaware in 2017 and then New Jersey, Maryland, and Virginia in 2018. Spotted lanternfly is a sizable planthopper insect (about 1 inch long and ½ inch wide) that originates from northern China and is also found in Vietnam, Japan, and South Korea.

This insect has a wide host range, consisting of more than 70 plant species, at least 40 of which occur in North America. The spotted lanternfly has caused economic damage to grapevines and has been observed feeding on fruit trees (apple, cherry, stone fruits), hops, and woody ornamental plants. A preferred host is the tree-of-heaven (*Ailanthus altissima*), a common yet invasive plant in California. These insects have piercing-sucking mouthparts and produce large quantities of honeydew, which enables the growth of sooty molds. In addition to being an agricultural and horticultural pest, the spotted lanternfly may also be a nuisance pest in urban areas due to their conspicuous aggregation behavior (Figure 2).

How can you identify the spotted lanternfly?

Each female produces one to two egg masses consisting of 30 to 50 eggs each. Seed-like eggs are laid in multiple successive rows and covered with a yellowish-brown waxy deposit (Figure 3).

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 possesses small wing pads (Figure 4).

Adults have a stout yellow abdomen with incomplete black bands (Figure 5) and two sets of wings. The



L. BARRINGER, PA DEPT AG

Figure 1. Side view of the adult spotted lanternfly.



L. BARRINGER, PA DEPT AG

Figure 2. Aggregation of adult spotted lanternfly in urban areas.



PA DEPT AG (L) KR LAWUSDA, APHIS (R)

Figure 3. Spotted lanternfly eggs covered with waxy deposits (left); seed-like eggs with holes where SLF nymphs have emerged (right).

...continued on page 2

WHAT'S INSIDE...

- Carbaryl restrictions | Page 2
- White Garden Snail | Page 3
- Revised Pest Notes | Page 4
- Ask the Expert! | Page 5

Spotted Lanternfly ...continued from page 1

forewings are a creamy beige with black spots, becoming small black rectangles toward the wing 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.

What is being done about the spotted lanternfly?

The spotted lanternfly has the potential to negatively impact high value crops in California if it becomes established. Research is underway to identify and test IPM strategies

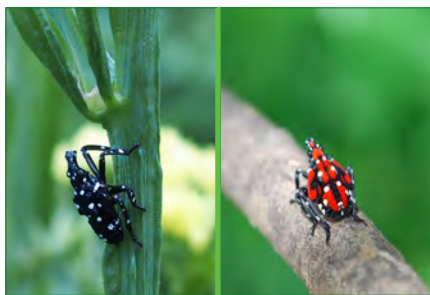
for anticipated invasive species in an effort to rapidly implement management options should they occur in California. Through this program, researchers at UC Berkeley and UC Riverside have begun to evaluate biological control agents for use against the spotted lanternfly.

What can you do about the spotted lanternfly?

Since the tree-of-heaven is a preferred host, these trees can be visually monitored for local detection. If you suspect you have sighted this insect, report it to your local county Agricultural Commissioner's office right away.

Document the exact location of the finding. Collect the insect in a sealable container to be delivered 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 both can be easily collected. Early detection is key and, together, we can all play a role in keeping this insect from establishing in California.

— *Cindy Kron,*
Area IPM Advisor,
UC Cooperative Extension, Lake,
Mendocino, Napa, and Sonoma
ckron@ucanr.edu



E SWACKHAMER, PENN STATE (L)
L BARRINGER, PA DEPT AG (R)

Figure 4. 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).



L BARRINGER, PA DEPT AG

Figure 5. Adult spotted lanternfly with wings spread.



R GARDNER, BUGWOOD

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

Carbaryl Becomes Restricted Material

Starting August 1, 2020, all carbaryl products will be restricted materials in California, except for baits labeled only for agricultural use. Once this regulation goes into effect, only licensed pesticide dealers can sell non-exempt carbaryl products. There is no sell-through period. You must be a California licensed pesticide applicator to purchase and use pesticides that are designated as restricted materials.

For more information, see the fact sheet from the California Department of Pesticide Regulation at cdpr.ca.gov/docs/license/pdf/carbaryl_outreach_flyer.pdf

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.

The White Garden Snail: A Potentially Serious Pest of Landscape Ornamentals

The white garden snail, *Theba pisana*, sometimes known as the Italian white snail, can be a serious pest of ornamental landscape plants; including trees, shrubs, groundcovers, and herbaceous plants (Figure 1). Although it has been established in California for at least 100 years, it has recently become more prevalent in southern California. A small population has also been detected in Half Moon Bay in coastal San Mateo County. If such observations and findings continue, this snail may become a major pest of 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 ornamental species. Feeding damage is typical of that caused by all snails and slugs: irregular holes with smooth edges, primarily on leaves or on the margins of leaves and on flowers (Figure 2). This snail also feeds on seedlings, ripening fruits, and even the bark of some young trees and shrubs. Because the white garden snail has an exceedingly high reproductive rate and is known to aggregate during feeding (thousands can amass on one tree), severe defoliation and eventual plant death are possible, potentially making this snail a major pest. Other pests; such as earwigs, caterpillars, and other chewing insects; can cause similar damage but will not produce the telltale silvery mucous trails.

Word of Caution

Use rubber or latex gloves when picking or handling snails and vegetation covered with their slime trails, and wash hands thoroughly afterwards.

These precautions are necessary because 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.



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

DR HODEL, UCCE



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

DR HODEL, UCCE

Identification and Biology

The adult has a medium-sized matte shell about the size of a nickel or dime (Figure 3). As the common name implies, the shell is typically ivory white (or, rarely, pink), but can be light beige with narrow, dark brown bands. The shell is variable in appearance, especially considering the presence and size of the dark bands and other markings. A similar looking but much less damaging snail, the milk snail (*Otala lactea*), sometimes occurs alongside the white garden snail and can be confused with it. The milk snail tends to be larger, about an inch (3 cm) in diameter, with the inside of the thick aperture (opening) appearing dark (Figure 4). Unlike most snails and slugs, the white garden snail climbs and aestivates (rests in a dormant state) 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



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

DR HODEL, UCCE

periods by forming a wall of dry mucus to seal the shell aperture, reducing water loss. They typically aggregate, massed together in great numbers, in an exposed, conspicuous manner to “ride out” the hot, dry season until the return of moisture and more suitable conditions in the fall.

After the first rains of the season, usually in November in California, these snails, which are cross-fertilizing hermaphrodites, become more active, mate, and descend to the ground from their vertical aestivation sites to lay eggs and forage. They deposit eggs just under the soil surface or within humus. Hatching usually occurs after 20 days. The white garden snail has a relatively short life span (one to two years), breeds only during a single season, and produces many eggs (more than 4,500 eggs per pair).

...continued on page 4

White Garden Snail ...continued from page 3

Management

Control of white garden snails can be time-consuming, difficult, and costly because of their high reproductive rate, the manner in which they can climb, sometimes rather high, up surfaces and objects, and their ability to aestivate for long periods until conditions are suitable for feeding activity and reproduction. Effective management must rely on a combination of methods, including exclusion, early detection, and a variety of treatments.

Like most land snails, natural dispersal of the white garden snail is limited, but movement to new areas is aided by human activity. To exclude it from your area, carefully check crates, boxes, and plants shipped from infested areas. To detect the white garden 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



DR HODEL, UCCE

Figure 4. The white garden snail (left) is smaller than the milk snail (right).

other snails, this snail aestivates in the open, where they are visible and conspicuous, perhaps offering the best opportunity for their control. In such cases, hand-picking or forceful dislodgement followed by sweeping or vacuuming might be the best removal tactics, especially with limited infestations or to protect small landscape plantings. Because this snail can aestivate in vacant fields or untended areas adjacent to landscape sites, these areas should be carefully checked, and the field mowed, or where appropriate, burned.

For extensive details on effective management methods; including habitat modification, biological control, hand-picking, and chemical control; see the comprehensive UC ANR article referenced below.

—Donald R. Hodel,
Landscape Horticulture Advisor
(emeritus),
UC Cooperative Extension, Los Angeles County,
drhodel@ucanr.edu

—Gevork Arakelian,
Entomologist, Los Angeles County Agricultural Commissioner/Weights & Measures, South Gate, CA,
GArakelian@acwm.lacounty.gov

—Cheryl A. Wilen,
Area IPM Advisor (emeritus), UC Cooperative Extension, San Diego County,
cawilen@ucanr.edu

This article was abbreviated from the original, first published 11/2018. ucanr.edu/sites/HodelPalmsTrees/files/294710.pdf

Revised Pest Notes



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 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



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 the 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

Visit UC IPM's *Pest Notes* web page for these and many more titles
ipm.ucanr.edu/PMG/PESTNOTES

Ask the Expert!

Q: What makes a weed an invasive plant?

A: Weeds are usually thought of as native plants we don't want in areas such as landscapes, fields, or vegetable gardens either because they reduce economic output or they are considered aesthetically displeasing. Invasive plants are generally non-natives that infest natural ecosystems and can become problems.

There are four distinctions between a weed and an invasive plant. The first is how they are introduced to an area. Weedy plants in gardens, landscapes, or in agricultural fields are usually accidentally introduced. While that is sometimes true for invasive plants, they are more often intentionally introduced as ornamental plants, for aquarium use, or for food, or fiber purposes.

Next, weeds require human disturbance, such as tilling, to establish and flourish in an area. Invasive plants do not require any human assistance to grow and spread.

Persistence is another distinction. Invasive plants tend to be more persistent in an area once established and don't require irrigation or fertilization so are capable of growing and flourishing in areas without human assistance.

Finally, most weedy plants grow on land as annuals or herbaceous perennials, but invasive plants can be aquatic, parasitic, vining, woody, or herbaceous. Their life cycles range from annual to perennial. For more information about invasive plants, see the UC IPM *Pest Notes* on Invasive Plants at ipm.ucanr.edu/PMG/PESTNOTES/pn74139.html and Woody Weed Invaders at ipm.ucanr.edu/PMG/PESTNOTES/pn74142.html.



Pampasgrass, a common invasive plant.

What did you think about this newsletter?

We want your feedback!

<https://bit.ly/3fMEwCv>



Subscribe to the UC IPM urban pest management blog!

UC IPM's blog provides readers with timely information about pests in and around homes, gardens, landscapes, and structures in California. We post articles about common seasonal pests, invasive pests, beneficials, and new UC IPM resources, including new and revised Pest Notes, training events, and other educational materials for residential audiences and pest management professionals.

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

Always read and carefully follow all precautions and safety instructions provided on the pesticide container label, as well as any other regulations regarding the use of pesticides. Not following label directions, even if they conflict with information provided herein, is a violation of state and federal law. No endorsements of named products are intended, nor is criticism implied of products not mentioned.

University of California Statewide Integrated Pest Management Program



2801 Second Street
Davis, CA 95618-7774
E-mail: ucipm@ucanr.edu
Online: ipm.ucanr.edu/greenbulletin
Editor: K. Windbiel-Rojas
Production: B. Messenger-Sikes

Produced by the University of California Statewide IPM Program with partial funding from the USDA NIFA CPPM Extension Implementation Program. For more information about managing pests, contact your University of California Cooperative Extension office, or visit the UC IPM website at ipm.ucanr.edu.

Connect with us!



@ucipmurban



@ucipm

ANR NONDISCRIMINATION AND AFFIRMATIVE ACTION POLICY STATEMENT

It is the policy of the University of California (UC) and the UC Division of Agriculture & Natural Resources not to engage in discrimination against or harassment of any person in any of its programs or activities. Complete nondiscrimination policy statement can be found at ucanr.edu/sites/anrstaff/files/215244.pdf.

Inquiries regarding ANR's nondiscrimination policies may be directed to John Fox, Affirmative Action Contact, University of California, Agriculture and Natural Resources, 2801 Second Street, Davis, CA 95618, (530) 750-1397.