LACE BUGS

Integrated Pest Management for Home Gardeners and Landscape Professionals

Over a dozen species of lace bugs (family Tingidae) occur in California. Each feed on one or a few closely related plant species. Hosts include alder, ash, avocado, coyote brush, birch, ceanothus, photinia, poplar, sycamore, toyon, and willow.

IDENTIFICATION

Adult lace bugs are about 1/8 inch (3 mm) long with an elaborately sculptured dorsal (upper) surface (Figure 1). The expanded surfaces of their thorax and forewings have numerous, semitransparent cells that give the body a lacelike appearance, hence the name "lace bugs." The wingless nymphs are smaller, oval, and usually dark colored with spines (Figure 2). Adults and nymphs occur together in groups on the underside of leaves.

Native species named after their host plants include the California Christmas berry tingid (*Corythucha incurvata*), ceanothus tingid (*Corythucha obliqua*), and western sycamore lace bug (*Corythucha confraterna*). The introduced avocado lace bug (*Pseudacysta perseae*) is a pest of avocado (*Persea americana*) and camphor tree (*Cinnamomum camphora*).

LIFE CYCLE

Lace bugs develop through three life stages: egg, nymph, and adult (Figure 3) and have several generations a year. Females insert tiny, oblong eggs in leaf tissue and cover them with dark excrement (Figure 4). Nymphs (immatures) develop through about five, increasingly larger, instars (growth stages) over a period of weeks before maturing into adults. Lace bugs can overwinter as eggs in leaves on evergreen hosts and as adults in protected locations, such as under bark plates and fallen leaves and other debris beneath host plants. All life stages can be present throughout the year on evergreen hosts in areas with mild winters.

DAMAGE

Lace bug adults and nymphs feed on the underside of leaves by sucking fluids from plants' photosynthetic tissues. This causes pale stippling and bleaching that can become very obvious on the upper leaf surface by mid to late summer (Figure 5). Adults and nymphs also foul leaves with specks of dark, varnishlike excrement; and this excrement sometimes drips onto pavement and other surfaces beneath infested plants. Certain other true bugs and thrips also produce leaf stippling and dark excrement. Mites also stipple leaves. Mite infestations usually can be distinguished by the absence of dark excrement and sometimes by the presence of mite cast skins and fine silken webbing. Examine the lower leaf surface, using a magnifying lens if necessary, to identify what type of pest is causing the damage.

Lace bug feeding is not a serious threat to plant health or survival. Prolonged high populations of lace bugs may cause premature drop of some leaves and a modest reduction in plant growth rate. On avocado premature leaf drop may lead to sunburn of some fruit and a subsequent reduction in fruit yield.

MANAGEMENT

Tolerate lace bug damage where possible. The injury is mostly aesthetic (cosmetic) and does not seriously harm plants. Provide proper cultural care so plants are vigorous. Conserve predators and parasites and apply cultural controls as discussed below to help suppress populations of at least some species of lace bugs.

No treatment will restore stippled foliage, which remains until pruned

Figure 1. Adults and nymph of a lace bug, the Christmas berry tingid.

Figure 2. A lace bug nymph, the Christmas berry tingid.

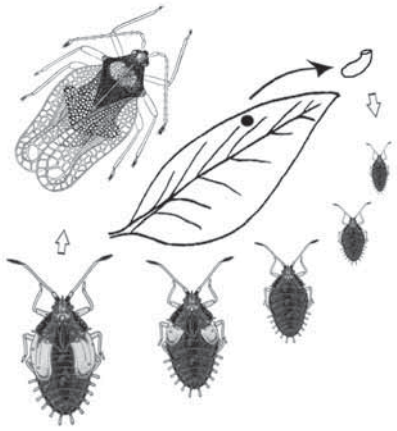

Figure 3. Life cycle and stages of avocado lace bug.

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off or replaced by new growth. If intolerable damage has occurred, during subsequent years inspect plants about once a week beginning in late winter. Take action when lace bug nymphs become abundant and before damage becomes extensive. A forceful stream of water directed at the underside of leaves beginning early in the season, when nymphs are the predominant life stage, and repeated at intervals can help to suppress, where feasible, lace bug populations on small shrubs. Various insecticides are available for use on landscape plants, but these products can adversely affect beneficial invertebrates and the environment.

Cultural Control

Grow plants that are well adapted to conditions at the site. Consider replacing plants that perform poorly or repeatedly experience unacceptable pest damage. Certain plant species growing in hot, sunny locations are more likely to be damaged by lace bugs. For example, azalea and toyon grown under partial shade experience less damage by lace bugs than when they are grown in locations more exposed to direct sunlight and higher temperatures. Provide adequate irrigation and otherwise provide plants with appropriate care.

On toyon and possibly other shrubs, lace bug survival during winter and subsequent damage in spring may be reduced by keeping soil beneath host plants bare during December through February, by shallowly cultivating the soil surface several times during this period, or using both practices. For example, during late fall rake away and compost leaves beneath lace bug host plants. If organic mulch is reapplied in spring, avoid using leaves from the same plant genus as mulch near that plant because it may harbor adult lace bugs.

Biological Control

Natural enemies of lace bugs include parasitic wasps, predatory assassin bugs, lacewing larvae (Figure 6), lady beetles, jumping spiders, pirate bugs, and mites. These beneficial species may not appear in sufficient numbers until after lace bugs become abundant, but their preservation is an essential part of a long-term, integrated pest management program. To increase natural enemy abundance and reduce lace bug damage, grow a variety of flowering plant species and provide partial shade to shrub species that are not adapted to grow in full sun. If applying pesticides, choose nonpersistent, contact insecticides to minimize the adverse effects on beneficial predators and parasites.

Chemical Control

Insecticides will not restore an undamaged appearance, but can reduce or prevent further damage. Apply insecticide only when pests are present or expected to become too abundant. Insecticides can have unintended effects, such as contaminating water, poisoning natural enemies and pollinators, and causing secondary pest outbreaks. Completely read and follow the product label instructions for the safe and effective use of that insecticide.

Nonresidual, Contact Insecticides. When properly applied, almost any contact insecticide will control lace bugs. Contact insecticides that do not leave persistent, toxic residues include azadirachtin (Safer BioNeem), insecticidal soap (Safer), narrow-range oil (Monterey Horticultural Oil, Volck), neem oil (Green Light, Garden Safe), and pyrethrin products, which are often combined with the synergist piperonyl butoxide (Ace Flower & Vegetable Insect Spray, Garden Tech Worry Free Brand Concentrate).

These insecticides have low toxicity to people and pets and relatively little adverse impact on the populations of pollinators and natural enemies and the benefits they provide. To obtain adequate control, thoroughly wet the underside of infested leaves with spray beginning in spring when lace bug nymphs become abundant. To provide adequate control, application may need to be repeated.

Systemic Insecticides. Systemic insecticides are absorbed by one plant part (e.g., trunks or roots) and moved (translocated) to leaves or other plant parts.

Figure 4. Excrement-covered lace bug eggs laid partly in leaf.

Figure 5. Bleached, stippled foliage caused by lace bug feeding.

Figure 6. Green lacewing larva eating a lace bug nymph.

In comparison with systemics that are sprayed onto foliage, products labeled for soil drench or injection or for trunk injection or spraying minimize environmental contamination and may be more effective. Trunk application of systemic insecticides can provide relatively rapid control. There is a longer time delay between soil application and insecticide action. Some uses require hiring a professional pesticide applicator. Certain home-use products can easily be drenched into soil around the tree trunk using the mix-and-pour method.

Systemic insecticides available for use against lace bugs include the neonicotinoids dinotefuran (Safari) and imidacloprid (Bayer Advanced Tree & Shrub Insect Control, Merit) and the organophosphate acephate (Lilly

Miller Ready-to-Use Systemic, Orthene). When properly applied, one application may provide season long control.

Some systemic insecticides can cause spider mite outbreaks and are toxic to beneficial insects that are directly sprayed or come into contact with treated leaves. Systemics can translocate into flowers and have adverse effects on natural enemies and pollinators that feed on nectar and pollen. Do not apply systemic insecticides to plants during flowering or shortly before flowering; wait until after plants have completed their seasonal flowering unless the product's label directions say otherwise. With soil application, when possible, wait until nearby plants also have completed flowering, as their roots may take up some of the soil-applied insecticide.

If applying systemic insecticide, use soil application or a trunk spray whenever possible. With trunk injection and implantation, it is difficult to repeatedly place insecticide at the proper depth. These methods also injure woody plants and can spread plant pathogens on contaminated tools. When injecting or implanting into multiple plants, scrub any plant sap from tools or equipment that penetrate bark and disinfect tools with a registered disinfectant (e.g., bleach) before moving to work on each new plant. At least 1 to 2 minutes of disinfectant contact time between contaminated uses is generally required. Consider rotating work among several tools, using a freshly disinfected tool while the most recently used tools are being soaked in disinfectant. Avoid methods that cause large wounds, such as implants placed in holes drilled in trunks. Do not implant or inject into roots or trunks more than once a year.

Residual, Foliar Sprays. Foliar sprays of broad-spectrum insecticides with residues that can persist for weeks are not recommended for lace bug control. Pesticides to avoid include carbamates (carbaryl or Sevin), nonsystemic organophosphates (malathion), and pyrethroids (bifenthrin, fluvalinate, permethrin). These are highly toxic to natural enemies and pollinators and can cause outbreaks of spider mites or other pests. Because their use in landscapes and gardens can run or wash off into storm drains and contaminate municipal wastewater, these insecticides are being found in surface water and are adversely affecting nontarget, aquatic organisms.

REFERENCES

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