Stealing the green

Prevention is the best defense against the azalea lace bug

By Robin Rosetta

Keep your eyes peeled for another set of thieves stealing from nurseries and landscapes in the Pacific Northwest.

They’ve been active up in Washington and the northern part of the Willamette Valley in Oregon, and recently intruded into landscapes in Salem.

The suspects go by the name *Stephanitis pyrioides*, but they’re also known as azalea lace bugs. They are best known for stealing the green from the leaves of azaleas and rhododendrons.

Azalea lace bugs were officially confirmed in Washington in 2008 and Oregon in 2009, but both states had anecdotal reports of infestations in prior years. The distribution of azalea lace bugs in Oregon and Washington has increased and will likely continue to expand.

Valuable ericaceous plant species in our landscapes and nurseries in the Pacific Northwest are at risk for damage.

Azalea lace bugs are members of the family of insects called *Tingidae*, or lace bugs. There are 68 species of lace bugs in the genus *Stephanitis* and several are established in North America, including *S. pyrioides*, *S. takeyai* (Andromeda lace bug), and *S. rbododendri* (rhododendron lace bug).

Azalea lace bugs are now found in parts of Australia, Asia, Europe and the northeastern, southeastern, and western United States.

Azalea lace bugs generally overwinter in the egg stage, but nymphs and adults do not diapause and can overwinter on the plants. Live adults

An azalea leaf showing stippling damage, and fecal spotting caused by azalea lace bug.

PHOTO BY ROBIN ROSETTA, OREGON STATE UNIVERSITY
were found on infested plants in Salem shortly after the record cold weather in December of 2013. The overwintering eggs tend to eclose, or hatch, in May or June, depending on the temperature or heat unit accumulation.

There are five nymphal stages of the lace bug prior to the final molt to a reproductive adult stage. There can be three to five generations per year, but the number of generations in the Pacific Northwest has not been determined.

**Detection**

Adult azalea lace bugs are about 3 millimeters in length. Their wings are held out flat and have transparent membranes with darkened areas (maculation) in both the anterior and posterior of the wings.

Lace bug eggs are inserted into the leaf tissue, usually in or adjacent to the midrib on the underside of the leaf, and covered with a brown layer of excrement, which hardens to protect the eggs. The nymphs are nearly transparent when they emerge from the eggs; later, they darken and become increasingly spiny with each successive molt. Developing wings or wing buds can be seen on the older nymphs.
Azalea lace bugs feed on the undersides of leaves, sticking their straw-like mouthparts through the leaf stomates and sucking up the cell contents from the leaf mesophyll. They remove the chloroplasts, literally stealing the green from the leaves!

Damage is first noted as individual stippling on the top of the plant leaves, which increases over time as a percentage of the leaf area is affected.

On azaleas, the damage can become quite severe, with the entire leaf area turning white. Later, in the fall and winter, the leaves turn brown and wither. Leaves may drop off heavily damaged plants.

On rhododendron leaves, early stippling damage may progress to heavy damage, exhibited by yellow leaves with green veins. Generally, damage begins early in the season on the older leaves, in which the overwinter eggs were laid, and moves onto newer growth as the nymphs and winged adults disperse. Black fecal spotting and molted skins of azalea lace bugs can also be found on the undersides of the leaves.

Azaleas and rhododendrons are considered the primary hosts on which azalea lace bugs feed and reproduce. In the literature, this species is noted as feeding on *Kalmia* spp. and *Pieris* spp., although these are not good hosts for them to reproduce on.

There have been no reports of feeding on *Kalmia* or *Pieris* here in Oregon, but a natural infestation has been reported on two undocumented plant species, prompting the Oregon Department of Agriculture to research the potential susceptibility of a range of important ericaceous hosts to this lace bug.

**Pest management**

If the lace bugs have not yet established themselves in a site, then management should begin with prevention.

If lace bugs are already introduced at a site, then their presence on infested material — particularly in the more cryptic egg stage — may be reduced with proper training of personnel to recognize all stages of the insect and its damage.

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There is a range of susceptibility among various azaleas and rhododendrons to feeding damage by azalea lace bugs. Much of the information on susceptibility has been developed for species and varieties grown in the Southeast. At this time there is only anecdotal information on the susceptibility of regional varieties and species of importance.

Developing a research-backed list of resistant regional varieties will offer consumers a choice as they seek to reduce the impact of lace bug damage in their landscapes.

In sites with existing infestations, we recommend implementing a monitoring program for plants with damage. The key time for management is late spring, when the first nymphs emerge from their eggs. Focus your scouting on these susceptible young nymphs, which are generally clumped together on older leaves.

In general, this timing for management will be better for contact during spray applications and prevention of feeding damage. Also, it will reduce the number of lace bugs that survive to develop wings for dispersal, or to mate and produce future generations of damaging populations.

Contact insecticides, such as pyrethroids, and systemic insecticides, such as acephate and neonicotinoids, work very well on azalea lace bugs. However, they may also impact beneficial insects.

If using lower toxicity contact insecticides, such as insecticidal soap, horticultural oil or neem-based products, the early timing of applications will enhance control of these insects. Good coverage of the undersides of the leaves also helps. Repeat applications may be necessary.

Both augmentative and classical biological control have been studied with azalea lace bugs. Green lacewing releases have been shown to be effective either alone or in combination with compatible insecticides.

Several species of predators and parasites, including an egg parasite, have shown good levels of suppression.
of azalea lace bugs in the eastern U.S. Out west, classical biological control holds promise for the reduction of azalea lace bug damage.

The future
There are several areas of research needed to help reduce the impact of azalea lace bugs.

We must assess the potential host range of azalea lace bugs here in the Pacific Northwest, including both economic and important native hosts. Delimitation of its current distribution in Oregon would be helpful.

A survey for native natural enemies should be conducted, as well as an evaluation of additional classical biological control options. The susceptibility or resistance of azalea and rhododendron species and cultivated varieties currently grown by the nursery industry should be assessed.

The development of a breeding program to find new selections less susceptible to azalea lace bug might be made a priority for the nursery industry as well.

Robin Rosetta is an associate professor of horticulture at Oregon State University, serving as an extension agent specializing in nursery integrated pest management at the North Willamette Research and Extension Center in Aurora, Ore. She can be reached at Robin.Rosetta@oregonstate.edu. Follow her on Twitter at @PNWNurseryIPM.

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