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Lacebugs: Life Cycle, Monitoring, and Pest Management in New Jersey

Deborah Smith-Fiola, Ocean County Agricultural Agent

Appearance and Habits

Lace bugs are small, delicate insects that are named for the transparent, lacelike texture of the wings of the adults. In New Jersey six lacebug species are common, primarily attacking Azalea, Mountain Laurel, Cotoneaster, Andromeda, Pyracantha, Rhododendron, and Hawthorn (Table 1). Although all species have similar life cycles, they emerge and are active at different times (Table 1).

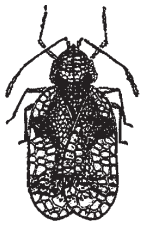

Figure 1. Adult

Figure 2. Nymph

Azalea Lacebug

Adults are 1/8- to ¼ inch long, with lacy wings held flat on the back (Fig. 1). They fly fairly well. Immature lace bugs (nymphs) are oval and colorless at birth, but soon turn black and spiny (Fig 2.) Nymphs do not have wings. Both adults and nymphs can be seen with the naked eye. All lace bug activity occurs on the underside of leaves.

Damage

Evergreen plants are preferred plant hosts over deciduous plants (those that drop their leaves). Lace bugs obtain food by piercing the leaf epidermis with their slender beaks and sucking the cellular "sap". This causes the upper leaf surface to appear stippled with minute white spots. Light feeding produces a yellowish stippling; heavier feeding causes leaves to appear white, or bleached, before they dry completely and fall off.

Table 1.

Lacebug Species	Host Plant(s)	Egg Hatch	Later Generations
Andromeda	Pieris (Andromeda)	late-May	July
Azalea	Azalea, Mountain Laurel	mid-May	June, July, August
Birch	Birch, Beech, Mountain Ash, Maple, Ironwood	May	June
Hawthorn	Cotonester, Hawthorne, Pyracantha, Quince	mid-May	early July, mid-August
Rhododendron	Rhododendron	late-April	Late May, June
Oak	Birch, Mountain Ash, Elm, Walnut, Cherry, Linden	June	August
Sycamore	Sycamore, Ash, Hickory, Mulberry	May	July, (Sept.)

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Damage typically appears first on older leaves and appears later on new growth.

The presence of a lace bug infestation can be determined by examining the **underside** of the leaves. Look for the actual insects (up to 10 lacebugs may be present on one leaf). As they feed, lacebugs deposit black, varnish-like **fecal spots** that stick to the leaf. These spots are a sure sign that lacebugs are (or were) present.

Lace bug feeding not only ruins the appearance of the host plant, but reduces its vitality. Shrubs may die if severe injury continues for several years and the plant is also under environmental stress. **Research shows that host plants are more susceptible to lacebugs if planted in full sun and subject to drought stress.** For example, azaleas planted in direct afternoon sun are approximately twice as likely to be infested by lace bugs than plants growing in the shade.

Heavy lace bug feeding on the foliage of trees causes stippling damage along leaf veins and premature leaf drop.

Life Cycle

Lace bugs overwinter in the egg stage. Eggs are inserted into the midrib, or vein, of the lower leaf surface and are usually covered with fecal material. Hatching occurs from late April until early June, depending on the lace bug species. The young nymphs feed and pass through five stages, or molts, before becoming adults in about 3 weeks. Adults lay eggs over an extended period, so it is possible to find all lace bug stages together on the underside of leaves at the same time. An entire generation can occur within 4-6 weeks, and more rapidly during hot weather. One to three generations are produced throughout the summer, depending on the weather (Table 1). Eggs or adults may overwinter, depending on the lace bug species.

Monitoring and Cultural Control

Examine plants carefully, beginning at the approximate time of egg hatch (Table 1) and continuing throughout the summer. Look on the underside of foliage for fecal spots, empty, shed "skins" from molted nymphs; eggs; or live lace bugs.

Remember that healthy plants, free from drought stress, are less susceptible to lace bug attack. Monitor plants in full sun more closely. Pay close attention to plants in areas of reflected light or heat, such as next to a building or sidewalk. Keep plants watered during dry periods, and mulch lightly to conserve moisture. Consider relocating the plant if lace bugs are a continual problem, or consider planting a resistant variety (Table 2) to avoid a lace bug attack entirely.

Table 2. Azaleas Resistant to Lacebug Attack (in order of decreasing resistance)*

Azalea Cultivars	Flower Color
Indica alba	white
Flame Creeper	white
Delaware Valley White	white
Rosebud	pink
Cooperman	red
Hahn's Red	red
Boldface	lavender
Mrs. G.G. Gerbing	white
Dream	white
Salmon Beauty	pink
Hinocrimson	red

*Research by Dr. Peter Schultz, Virginia Beach Experiment Station, Virginia Polytechnic Institute.

Control Methods

Control when live lace bugs are first observed in order to prevent foliar damage.

1. Biological Control

Several biological control agents, or beneficial insects, have been reported. Naturally occurring predators include the azalea plant bug, tree crickets, earwigs, minute pirate bugs, and spiders.

Larvae of the green lacewing have shown promise as a biological control agent. In a nursery study, purchased green lacewing larvae released against newly hatched azalea lace bug nymphs resulted in 79-97% control.

2. Biorational pesticide control

Insecticidal soap and horticultural oil will control lace bugs, *but to be effective, must contact them directly* on the underside of the foliage. **Insecticidal soap** has a short residual and may require repeat applications. Azalea lace bug populations have been reduced 88-91% by thoroughly covering the underside of foliage with insecticidal soap. Horticultural oil is effective as a direct contact treatment on active lace bugs, and will also kill some eggs. Oil can be used as a dormant spray (3%) or during the growing season (1%).

Neem oil (azadirachtin) acts as a feeding inhibitor, an insect growth regulator, or both. Research in Maryland showed a 50% reduction in azalea lace bugs after a Neem application.

3. Chemical Control

Most insecticides, except for horticultural oil, are not effective on the egg stage of the lace bug, so preventive sprays are useless. Therefore, it is important to monitor first to make sure that the insect is indeed present before spraying. Insecticides should be applied 7 to 10 days after eggs hatch. If needed, follow with a second application a week later (if insects are still present). Note that if the first generation is controlled, subsequent sprays may not be necessary during the remainder of the season. Continue to monitor, looking for live lace bugs and objectionable damage before spraying.

a) contact sprays

Lace bugs may be may be controlled with contact insecticides, including Permethrin, Cyfluthrin (Tempo 2), Scimitar, and carbaryl (Sevin). The spray must be directed toward the underside of leaves, however, or control will be inadequate. Doing so on small to medium plants can be a formidable task, notwithstanding the danger to the applicator. Additionally, these contact pesticides may kill any beneficial insects present.

b) systemic sprays

In general, systemic insecticides will give better control with less precise technique. Acephate (Orthene) gives excellent lace bug control when used according to label instructions. Spray directly onto foliage when lace bugs are present. Imidacloprid (Merit) is labeled for use by professional landscapers as either a foliar treatment (apply 6 to 8 weeks prior to egg hatch) or soil treatment (drench or injection; apply in late fall or early winter).

Desktop publishing by Rutgers-Cook College Resource Center Revised: September 2001

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