Control of Lace Bugs on Broadleaf Evergreens

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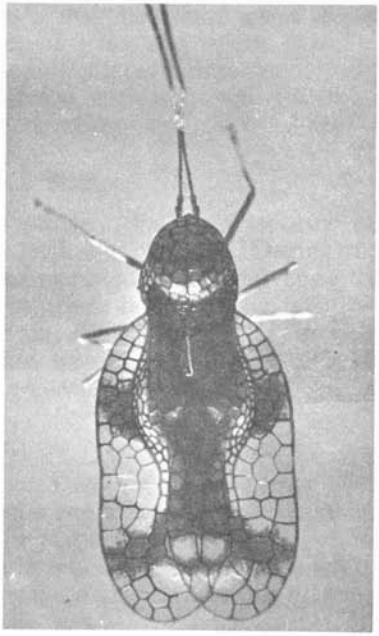

Adult of the andromeda lace bug, which is about ⅛ of an inch long.

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Lace bugs are small flat delicate insects with gossamer wings. The adults are about 1/8 of an inch long. The nymphs range in size from less than 1/32 of an inch in length to about the size of the adult at the time of the last molt. They feed by sucking plant juices from the underside of foliage. Hundreds and sometimes thousands may be found on a single large leaf, as on sycamore. Many varieties of trees and plants serve as hosts to the insects, including hawthorn, mountain laurel, elm, oak, quince, sycamore, and chrysanthemum. This publication deals only with lace bugs injurious to andromeda, azalea, and rhododendron.

ANDROMEDA LACE BUG

The andromeda lace bug, *Stephanitis globulifera,* has been reported on in earlier publications of this Station, Schread (1) and (2). During the past eight years, additional tests have demonstrated the effectiveness of newer insecticides in preventing lace bug injury to host plants.

So far as is known the Japanese andromeda, *Pieris japonica,* is the only species in this genus that is attacked by this lace bug. A species of scale insect, leaf spot, and root rot also occur on andromeda.

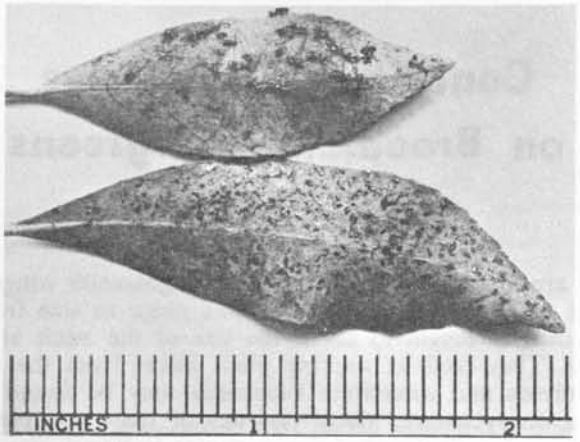
Distribution

The andromeda lace bug was first reported from Connecticut in 1946 by Bailey (3). Since then it has spread into many areas where *P. japonica* is grown. The principle means of spread is through transportation of infested plants with eggs imbedded in the underside of the leaves. The adults are not strong fliers and only local spread may be expected in this manner.

Injury

Although andromeda, azalea, and rhododendron may grow intimately together, the andromeda lace bug confines its activity to *Pieris japonica.* Two additional species of lace bug normally occur on azalea and rhododendron. These two species do not feed on andromeda.

Both the adults and nymphs damage andromeda by sucking the sap from the underside of the leaves. Injured foliage becomes stippled and mottled with grayish blotches. Blanched and yellowed leaves, (the undersides of which may be coated with a molasses-like excrement) sometimes drop from the plant, resulting in dieback of twigs and small branches.



Adults and nymphs of the andromeda lace bug with their molasses-like droplets of excreta.

Description

The adults of the andromeda lace bug are delicate insects about 1/8 of an inch long and lace-like in appearance. The hood which covers the head and the wing markings are intensely black. Immediately following the final molt from nymph to adult, the wings are more or less translucent. This, however, is soon followed by the black color pattern. Except for size and lack of wings the nymphs resemble the adults.

Life History and Habits

The insects overwinter in the egg stage in the leaves of infested plants. In January 1966, examination of 161 leaves taken close to the ground and 125 leaves taken from the top of the plant indicated that all of the overwintering eggs were deposited in the foliage at the bottom of the andromeda. The eggs of the summer generations were located in new foliage at or near the top of the plant. With the exception of parasitized eggs (30%) all of the eggs at the top of the plant had hatched. None of the overwintering eggs had hatched. Forty-five of them were dissected, revealing 15% parasitism. There was only one species of parasite, belonging to the family Mymaridae (genus *Anaphes*).

Several overlapping generations occur during the growing season. Adults of the last generation are common during November. An examination of a plant on December 14, 1967 indicated a count of 18 lace bugs, most of them on the sunny side of the plant. They were scattered on the lower surface of the foliage.

AZALEA LACE BUG

The azalea lace bug, *Stephanitis pyrioides,* resembles the andromeda species in general appearance, but the color markings on the head and wings are considerably lighter. The nymphs are spiny and with the exception of size, look very much like the adults which are about 1/8 of an inch long.

Nymphs feed on the underside of azalea leaves causing a grayish mottling, speckled with small molasses-like droplets of excrement. When serious infestation occurs among the evergreen varieties of azalea such as *Azalea obtusum amaenum, A. Hinodegiri,* and *A. Kaempferi,* all of the foliage may appear light gray to whitish. There are several generations a year.

RHODODENDRON LACE BUG

The rhododendron lace bug, *Stephanitis rhododendri,* is related to the azalea lace bug, resembling it closely. It is light in color but lacks the dark head and wing markings that distinguish the andromeda species. The nymphs are like those in related species, that is spiny in appearance. They feed by sucking plant juices from the lower surface of the leaves. This causes mottling and russeting. Furthermore, numerous small blackish specks of excrement are found. The upper surface of seriously infested leaves lose their rich green luster, becoming more or less pale yellowish or whitish. In addition, the leaves may curl under and drop prematurely. There are two generations during the growing season. Overwintered eggs imbedded in the leaf tissue on either side of the midrib hatch in May. *Rhododendron maximum* and *R. catawbiense* were used in our tests.

EGG DEPOSITION

The mechanism of egg deposition for the three species appears to be the same. Eggs are deposited in the underside of the leaves of the host plants. Eggs of the andromeda and rhododendron lace bugs may be recognized by the presence of longitudinal roughened, corky or russet-colored areas adjacent to the midrib. These areas vary in length depending on the number of eggs deposited in them. Eggs may also be deposited singly or several together near the midrib or scattered elsewhere. Perhaps because of the much smaller size of the leaves (when compared to andromeda and rhododendron foliage) the eggs of the azalea lace bug are laid individually and indiscriminately in any area of the underside of the leaves. However, many of them appear to be close to the midrib.

Eggs are first covered with a thin coating of a brownish-colored secretion which is followed by a much heavier layer or droplet of excrement. This may be intended for added protection, especially for the overwintering eggs. Depending on weather conditions, eggs may hatch as early as May 10. There may be as few as 7 or as many as 107 nymphs per leaf. The nymphs feed together until after the first or second molts; they then scatter over nearby foliage. The summer generations of the three species deposit their eggs in new but mature foliage at or near the outer areas of their host plants. Winter eggs appear to be scattered throughout the plants. The first adults appear during early June. By the middle of the month, all adults of the first generation are present.

CONTROL MEASURES

Sprays and Dusts

Control of the lace bugs during the early 1950's was obtained with malathion, lindane, nicotine sulfate, DDT, and chlordane. During the last decade additional insecticides have been tested successfully against all three species. Because of the number of insecticides used in spray and dust form on andromeda, azalea, and rhododendron, and the high order of efficiency indicated for all in controlling lace bugs, no detailed tabulation of results is presented.

The following materials were used in emulsifiable concentrate form in dilution of ¼, ½, 1, and 2 pints in 100 gallons of water, dimethoate (Cygon®) diazinon, Gardona®, Dylox®, and Sevin®. Triton B1956® or Aqua-Gro® wetting agents were used in each spray at the rate of 4 oz. in 100 gallons of water to obtain uniform coverage of the foliage. Treatments were applied with a 3-gallon hand pressure sprayer. Treated plants ranged in size from 2 to 8 ft in height (rhododendron were the largest). One thorough treatment with each insecticide in July or in August was all that was needed for excellent control.

Control data were taken by shaking five areas of a plant to dislodge the insects onto a piece of white cloth. Some dead lace bugs dropped to the ground before the plants could be examined. Hence counts were not available in all instances. None of the materials caused any noticeable injury to new or old foliage on treated plants. Lace bugs on untreated plants averaged 250, in a range of 20 to 800.

Dust treatments

Five-per cent dust formulations of malathion, Sevin®, DDT, methoxychlor, and Thiodan® were used on 30- to 40-inch andromeda plants in June and July, 1965 and 1966. A moderately heavy application of each was applied with a hand duster. Control of lace bugs was complete with these insecticides. Untreated plants indicated infestations of nymphs and adults in a range of 175 to 270 per 10 leaves and three shakings. There was no injury from the treatments.

Systemic insecticides

Systemic pesticides have shown great promise in controlling insects and mites on ornamentals. A systemic pesticide is one that is absorbed by the roots, foliage, or other areas of a plant and carried in the sap to all parts of the treated plant where pests are feeding.

A single treatment of this type has given satisfactory results in controlling lace bugs during the season in which it is used as well as for a year or two thereafter. In addition to the advantages mentioned, systemic insecticides eliminate the need for continuous spraying or dusting during the growing season. Because a systemic is confined inside the plant it is for the most part out of harm's way. Hence wildlife, children, household pets, domestic animals, and beneficial parasite and predatory insects do not come in direct contact with it. Another consideration in control of plant pests is the loss of spray or dust residue through weathering. A systemic incorporated in a plant sapstream is well "barricaded" by the exterior areas of the plant.

Systemics should be used only on plants or crops indicated on the label accompanying the package. They are available in several forms. Granules may be used as a broadcast treatment, side-dressing, or mixed in the soil. Liquid concentrates may be injected into the soil, watered onto the surface of the ground, or sprayed onto the foliage. The granules are reasonably safe to use.

Systemic experiments

A test was undertaken on July 15 using 5% dimethoate granules at the rate of 12 and 24 ounces of formulation on 5-foot azalea plants. The soil was raked away from the base of the plants to their drip-line to a depth of about 2 inches. The granules were applied evenly to the raked areas at the rate of 8, 16, and 32 oz. of formulation per plant. The treatments were drenched with water and the soil was replaced. There were four plants for each rate of treatment, and untreated checks.

The method of determining lace bug populations following treatments was to jar or shake an area of a plant to dislodge dead and live lace bugs so that they would fall onto a white cloth 16" square placed on the ground under the plant. This was repeated five times in various areas of a plant.

Control data taken August 18 showed that complete control of lace bugs had been obtained with dimethoate soil treatments. Untreated plants indicated an average of 95 lace bugs in a range of 52 to 139, with three shakings.

SUMMARY

The inescticides dimethoate, diazinon, Gardona®, Dylox®, Sevin®, malathion, DDT, methoxychlor, and Thiodan® used as sprays and dusts were highly effective in controlling lace bugs on andromeda, azalea, and rhododendron. Dimethoate soil treatments gave excellent seasonal control of the insects.

The insecticides listed in this publication controlled lace bugs on broadleaf evergreens in experiments. A practical dilution was 1 pint of liquid formulation in 100 gallons of water (1 teaspoon per gallon). Wettable powders were used at the rate of 1 to 2 pounds per 100 gallons of water (2 to 4 teaspoons per gallon). Dusts applied as a light coating also gave effective control.

Systemic soil treatments of 2 to 4 ounces of granular insecticide per small plant and 4 to 8 ounces per larger plant gave good results.

One spray or dust used in late May or early June usually controlled lace bugs for the season. The underside as well as the upper surface of the foliage was treated.

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