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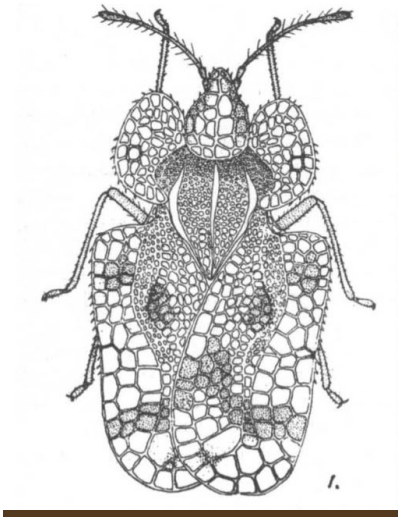

LACE BUGS

Insect Pest Management in Hybrid Poplars Series

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Lace Bugs

Corythucha salicata Gibson (Heteroptera: Tingidae)

Introduction

Lace bugs are generally not a pest of poplars grown east of the Cascade Mountains, but expanded plantings of poplars for potential biofuel production in western Oregon and Washington have been attacked by these sap-feeding insects. Our objective is to alert professional integrated pest management (IPM) personnel to the potential damage lace bugs can cause in hybrid poplars grown for biofuel west of the Cascade Mountains in the Pacific Northwest (PNW).

Taxonomy

Lace bugs are common in North America: 160 species have been identified (Hoover 2002) and over 12 species have been reported from California alone (Dreistadt et al. 2004). The western willow tingid, *Corythucha salicata* Gibson (Figure 1), has been a pest of apple orchards in Oregon and Washington for 80 years (Thompson and Wong 1933). The top dorsal surface of the front wings, head, and thorax of adults is membranous, thus giving a lacelike appearance, hence their common name, lace bug. Nymphs are spiny and much darker in appearance than adults. Another tingid, *C. elegans*, feeds on poplar and willow in both Oregon and Washington (Gninenko 2007).

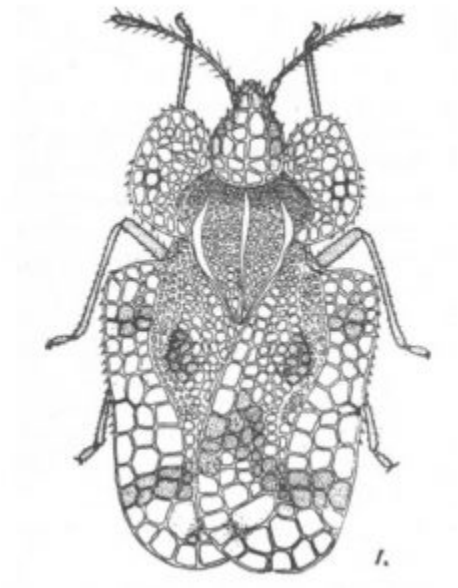

Figure 1. Drawing of an adult *Corythucha salicata* by Thompson and Wong (1933).

Hosts

Several species of Corythucha lace bugs feed on broadleaf trees. All species are rather host specific, and *C. elegans* and *C. salicata* infest poplar and willow in the PNW. Froeschner (1971) was the first to record their attack on *Populus tremuloides.* Lace bugs that feed on Salicaceae are known as *Corythucha* spp. and feed on willow, balsam poplar, bigtooth aspen, and quaking aspen (Raupp et al. 2002). Initial specimens that lead Gibson (1918) to identify *Corythucha salicata* as a new species came from willow. Current lace bug specimens collected from poplars in western Oregon were identified as *C. salicata* by Laura T. Miller, West Virginia Department of Agriculture, Charleston, West Virginia.

Range

Western willow tingid *C. salicata* has been collected from Nevada (Froescher 1971), Oregon, and Washington in the US, and from British Columbia and Manitoba Canada (Thompson and Wong 1933).

Life History

Small (3–8 mm) rectangular-shaped adults overwinter in rubbish on the ground or moss on nearby trees (Thompson and Wong 1933). Feeding and mating occurs in April. After bud burst, females oviposit eggs on the underside of new leaves starting in late April and continuing into July. Heteroptera have hemimetabolous development, meaning nymphs look like miniature adults without wings (Figure 2). There is no pupal stage. Most lace bug species have five nymphal stages before the winged adult appears. Nymphs hatch in early spring and feed on the leaves in aggregations. Development from the egg to fifth instar requires about 25 days (Thompson and Wong 1933).

Figure 2. Early nymphs of lace bug on under surface of poplar leaf (Photo by R.A. Rodstrom).

Figure 3. Early stage of lace bug damage to poplar leaf (Photo by R.A. Rodstrom).

Damage

Both adults and nymphs feed on the undersurface of leaves, piercing the epidermis and sucking out fluid. Chlorotic 'specks' on leaves (Figure 3) can be confused with mite or thrip damage, but lace bug feeding injury causes larger spots than those of mites. Larger populations of lace bugs cause pale stippling or bleaching and their black excrement forms a varnish-like appearance (Dreistadt et al. 2004). Use a magnifying lens to determine if the causal agents are mites, thrips, or lace bugs. An economic damage level would be when 30–40% of the leaves sampled were 50% or more necrotic.

Biological Control

Mirid plant bugs, also called 'pirate bugs' are predators of lace bug nymphs and adults. They are about the same size as adult lace bugs, but their body is narrow and often colored red and black (Sparks et al. 2015). Other natural enemies include parasitic wasps and generalist predators of soft-bodied insects.

Monitoring

Weekly visual inspections of plants for chlorotic areas can determine the presence of either lace bugs, thrips, or mites. Select exterior edge areas, near roads or openings within the plantation. Walk 100 feet down a row and examine the terminal five leaves on the top five branches for yellowish coloration or bronzing on the upper surface of each leaf. Turn each discolored leaf over and look for frass or lace bugs. Move between 10–30 rows to the left or right and repeat the 100 foot path examining the terminal portions of the trees. Repeat this pattern five times.

Management

Three systemic insecticides will control lace bugs; imidacloprid, dinotefuran (two neonicotinoids), and acephate, an organophosphate (Dreistadt et al. 2004). Both neonicotinoids should be applied as a soil drench. Dinotefuran can be applied to the foliage because of its translaminar mobility, but a soil drench application is safer for beneficial insects. Acephate is only registered for injection (Ace-jet) into individual trees, which is not practical for biofuels. In addition to the systemic insecticides mentioned above, other broad-spectrum foliar sprays are registered (PICOL 2016) for use on trees used for pulp/wood production (carbaryl, dimethoate, Lambda-cyhalothrin, malathion, permethrin), but these are damaging to beneficial insects. If used, apply according to the label as late in the day as possible.

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Use pesticides with care. Apply them only to plants, animals, or sites as listed on the label. When mixing and applying pesticides, follow all label precautions to protect yourself and others around you. It is a violation of the law to disregard label directions. If pesticides are spilled on skin or clothing, remove clothing and wash skin thoroughly. Store pesticides in their original containers and keep them out of the reach of children, pets, and livestock.

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