



PEST WATCH: VIBURNUM LEAF BEETLE

Home Garden Series

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Introduction

The viburnum leaf beetle (*Pyrrhalta viburni*) is an invasive pest from Europe that is currently established in the eastern United States, British Columbia, and parts of Washington. The beetle's wide distribution, particularly in western North America, increases the likelihood of this pest expanding its range in the Pacific Northwest.

Heavy infestations can cause branch dieback and death of several Viburnum plant species including native species and popular ornamentals found in home landscapes. The purpose of this factsheet is to educate landscape professionals, nurseries, and home gardeners about the occurrence of this new pest.

Distribution

Viburnum leaf beetle (VLB) was introduced from Europe to North America sometime in the early 1890s. The earliest recorded collections in North America are from 1924, in Nova Scotia, Canada, although there is no evidence that these were from reproducing populations (Weston et al. 2007). The beetle became established in and around Ottawa, Ontario, in the late 1970s, and was first recorded in the United States in Maine, in 1994.

VLB has since spread to neighboring states, including New York, Connecticut, New Hampshire, Massachusetts, Vermont, and Pennsylvania (Weston et al. 2007). The beetle has also spread into several midwestern states, with recent finds in Ohio, Michigan, Wisconsin, and Illinois (NAPIS 2015).

In 2001, gardeners in British Columbia found VLB on southern Victoria Island and in the Fraser Valley (Hueppelsheuser 2010). It quickly spread southward into Washington State. In 2004, VLB samples from a homeowner north of Bellingham were confirmed at the Washington State University Whatcom County Extension Master Gardener Clinic. Further survey found VLB throughout Whatcom County; the beetle was detected in northern King County in 2015.

If the pest is found beyond its reported range of Whatcom, Skagit, Snohomish, and King Counties in Washington State, please report these new finds to the authors or your local Extension office.

Identification and Life Cycle

In the Pacific Northwest region, VLB has one generation per year and overwinters as eggs. Overwintering eggs are found in protective wounds along the twigs of last year's growth. Eggs hatch in spring and the small larvae begin to feed on the foliage. Often, egg-hatch is timed with the unfolding of the host plant's leaves in spring. The newly hatched larvae are very small (about 1/16 inch long) and greenish-yellow (Figure 1).



Figure 1. Early instars and feeding damage to viburnum of VLB larvae in the spring. Photo by Todd Murray.

Initially, small larvae graze on the undersurface of the leaf between leaf veins, removing the soft leaf tissue. As feeding continues, the larvae grow and begin to darken in color. A pattern of dark spots will also begin to appear on each larva as it matures (Figure 2).

There is a characteristic habit to the larval feeding where the foliage is consumed between the leaf veins, leaving only a skeletonized leaf when feeding is complete (Figure 3).

The mature larvae will reach 1/2 inch in size and crawl down the host plant to pupate in the soil. Larvae construct a pupal cell from soil particles and bodily secretions within the first inch of soil (Weston and Desurmont 2008). The pupal stage typically lasts two to three weeks, ending with the emergence of an adult beetle from the soil. Adults are 1/4 to 3/8 inches long and are bronze to brown in color with filamentous antennae (Figure 4).



Figure 2. Later instar of a feeding VLB larva. Photo by Todd Murray.



Figure 3. Characteristic skeletonized leaf-feeding damage to viburnum leaves by later instar larvae. Photo by Todd Murray.



Figure 4. Adult VLB. Photo by Todd Murray.

Host plant feeding resumes as adult beetles chew oblong shot holes in the viburnum leaves (Figure 5). As adults, they migrate to new plants, continue to feed, then mate and lay eggs.



Figure 5. Adult VLB and feeding damage to viburnum leaves. Photo by Todd Murray.

Females make small notches in the tips of branches where they will lay an average of five eggs per oviposition site (Figure 6). The female beetle covers the eggs with a protective substance that is composed of excrement and chewed plant material (Hilker 1992). Females can lay up to 500 eggs in her lifetime, which typically lasts until the first frost.



Figure 6. Viburnum leaf beetle egg-laying (oviposition) wounds on woody viburnum stems. The eggs had already hatched when this photo was taken. Photo by Todd Murray.

Pest Damage

VLB feeds on Viburnum plant species in both adult and larval stages, causing significant damage when populations are high. Infestations can leave bushes defoliated throughout the growing season (Figure 7). Two to three years of consecutive defoliation can kill a well-established Viburnum bush.

The beetles prefer certain species and cultivars of Viburnum over others. The viburnum leaf beetle may not only be a pest problem for gardeners and landscapers, but may cause problems for nurseries, growers, restoration programs, and native habitats. Sargent viburnum (*Viburnum sargentii* ‘Susquehanna’ Koehne) and American cranberry bush (*Viburnum trilobum* ‘Bailey’s Compact’ Marsh.) are very susceptible to defoliation.

Varieties like double-file viburnums (*Viburnum plicatum* f. *tomentosum* ‘Mariesii’ [Thunb.]) and leatherleaf varieties (*Viburnum* spp. [*rhytidophylloides*] J. Sur.) are more resistant to VLB attack and infestation (Weston and Desurmont 2002).

Resistance to VLB is attributed to a number of traits (Desurmont et al. 2012) including plant chemistry and plant-induced defenses. A list of the most susceptible or resistant species of viburnum can be found at [Viburnum Leaf Beetle Citizen Science, Susceptibility to Infestation](#) (Weston 2015).

In North America, VLB have overcome some defenses by coordinating aggregated oviposition attacks and overwhelming the plant’s ability to crush or push out eggs (Weston and Desurmont 2011; Desurmont et al. 2012). As VLB spreads into new areas, consider planting resistant cultivars and species.



Figure 7. Defoliated mature viburnum bush in a home landscape. This bush died after three consecutive years of VLB infestation and leaf defoliation. Photo by Todd Murray.

Pest Management

Begin monitoring for egg wounds after the first frost in fall and winter. Prune branches or physically destroy the eggs if practical. Begin monitoring for larvae when the first leaves begin to form in spring. Manually removing the larvae—though labor intensive—can significantly reduce plant damage.

Applying a sticky barrier such as Tanglefoot to the base of the bush stems will trap migrating mature larvae as they move to the soil in late spring. Researchers have found that the majority of larvae migrate down the stems of viburnum plants to pupate (Weston and Desurmont 2008). While the application of Tanglefoot, or a like substance, hasn’t been tested, it allows for the opportunity to disrupt the migration by using a sticky barrier.

The application of the sticky insect barrier will be identical to the methods used for keeping adult root weevils from walking up the stem to feed on plant leaves. After the adult leaf beetles have emerged, regularly remove and destroy the adults by hand. This is easiest when done in the morning before the beetles become too active.

Insecticide management recommendations can be found on the WSU HortSense website <http://pep.wsu.edu/hortsense/>. Applications target the young larvae in early spring.

Two nematode species, *Heterorhabditis bacteriophora* and *Steinernema carpocapsae*, can help control VLB (Weston and Desurmont 2008). Nematode applications made prior to VLB larvae migration to the soil were most effective at reducing the survivorship of the pupae.

To learn more about how to use nematodes, see [Using Entomopathogenic Nematodes for Crop Insect Pest Control](#) (Miles et al. 2012).

Other biological controls for VLB have yet to be studied in depth. There are a few predatory insects that have been shown to feed on VLB in the eastern U.S. (Desurmont and Weston 2008). Other generalist predators, such as small songbirds, also prey on VLB. To learn more about beneficial insects and how to recruit them, see [Beneficial Insects, Spiders, and Other Mini-Creatures in Your Garden: Who They Are and How to Get Them to Stay](#).

If you find viburnum leaf beetles outside their known range of Whatcom, Skagit, Snohomish and King Counties, please contact your local Extension office.

Report a New County Record

To report a new county record of the viburnum leaf beetle, submit samples to your local WSU Extension Master Gardener Clinic (<http://mastergardener.wsu.edu/>) or contact Todd Murray (tmurray@wsu.edu).

References

- Desurmont, G. A. and P.A. Weston. 2008. Predation by *Podisus maculiventris* (Say) (Hemiptera: Pentatomidae) on Viburnum Leaf Beetle, *Pyrrhalta viburni* (Paykull) (Coleoptera: Chrysomelidae), Under Laboratory and Field Conditions. *Environmental Entomology*. 37(5): 1241–1251.
- Desurmont, G. A., F. Hérard and A. A. Agrawal. 2012. Oviposition Strategy as a Means of Local Adaptation to Plant Defense in Native and Invasive Populations of the Viburnum Leaf Beetle. *Proc. Royal Society Biological Sciences* 279: 952–958.
- Hilker, M. 1992. Protective Devices of Early Developmental Stages in *Pyrrhalta viburni* (Coleoptera, Chrysomelidae). *Oecologia* 92(1): 71–75.
- Hueppelsheuser, T. 2010. [New Insect Pest Introductions to British Columbia](#). British Columbia Ministry of Agriculture. Accessed 12/23/2015.
- James, D. 2014. [Beneficial Insects, Spiders, and Other Mini-Creatures in Your Garden: Who They Are and How to Get Them to Stay](#). *Washington State University Extension Publication* EM067E. Accessed 12/23/2015.
- Miles, C., C. Blethen, R. Gaugler, D. Shapiro-Ilan and T. Murray. [Using Entomopathogenic Nematodes for Crop Insect Control](#). *Washington State University Extension Publication* PNW544. Accessed 12/23/2015.
- NAPIS. 2015. [Pest Tracker: Survey Status of the Viburnum Leaf Beetle](#). Accessed 08/15/2015.
- Washington State University Extension. 2015. [Hortsense: Home Gardener Fact Sheets for Managing Plant Problems with IPM or Integrated Pest Management](#). Washington State University.
- Weston, P.A. 2015. [Viburnum Leaf Beetle Citizen Science: Susceptibility to infestation](#). Accessed 12/23/2015.
- Weston, P.A. and G. Desurmont. 2011. Aggregative Oviposition of a Phytophagous Beetle Overcomes Egg-crushing Plant Defenses. *Ecological Entomology* 36: 335–343.
- Weston, P.A. and G. Desurmont. 2008. Pupation by Viburnum Leaf Beetle (Coleoptera: Chrysomelidae): Behavioral Description and Impact of Environmental Variables and Entomopathogenic Nematodes. *Environmental Entomology* 37(4): 845–849.
- Weston, P.A. and G. Desurmont. 2002. Suitability of Various Species of Viburnum as Hosts for *Pyrrhalta viburni*, an Introduced Leaf Beetle. *Environmental Horticulture* 20(4): 224–227.
- Weston, P. A., G. Desurmont, and E. R. Hoebeke. 2007. Viburnum Leaf Beetle: Biology, Invasion History in North America, and Management Options. *American Entomologist* 53: 96–101.



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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