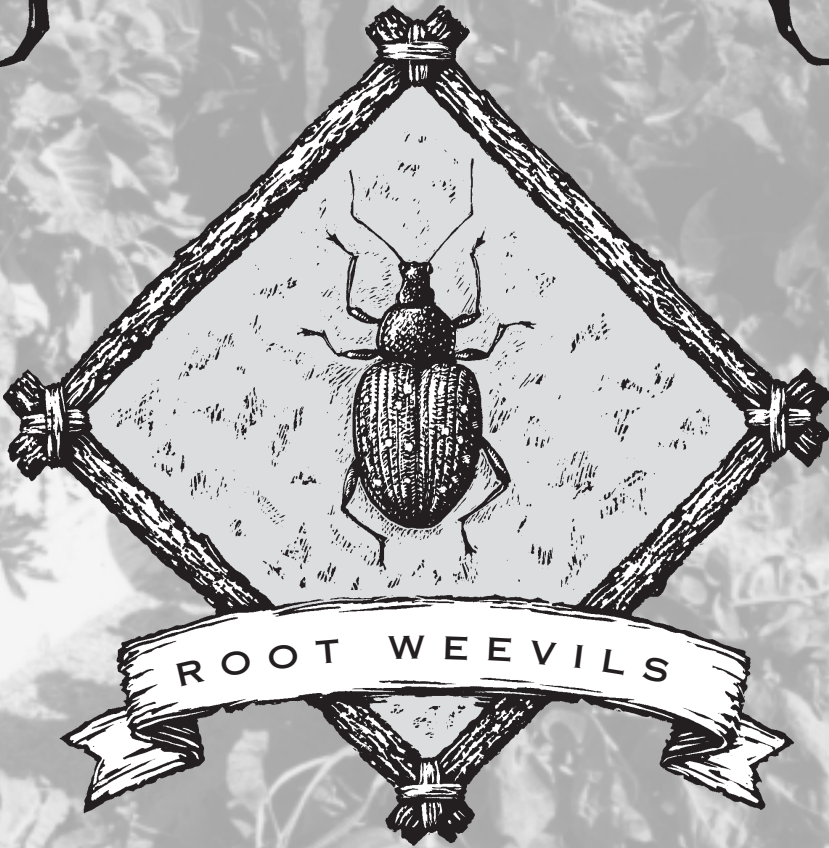


COMMON SENSE

Gardening



*A guide to root weevil control
for the earth-friendly gardener.*

PREPARED BY

THURSTON COUNTY LOCAL HAZARDOUS WASTE PROGRAM

A JOINT EFFORT OF THURSTON COUNTY HEALTH DEPARTMENT AND THURSTON COUNTY WATER AND WASTE MANAGEMENT

Know Your Pest

Root weevils feed on a wide variety of plants. Those that feed on shrubs prefer broadleaf evergreens, with rhododendrons and azaleas being their favorite food. Although adult root weevil damage to leaves rarely kills these plants, the damage can be visually irritating to the gardener.

There are several kinds of root weevil, but only three are significant feeders on broadleaf evergreens: the obscure root weevil, black vine weevil and the woods weevil. All look similar, with six legs, hard shells and oblong bodies varying in length from 1/2 to 1/4 inch long. Like many weevils they are stout and sturdy in appearance with mechanical or robot-like movements. The obscure weevil is brown with wavy brown lines across its back. The black vine weevil is black to dark brown with flecks of yellow. The woods weevil is light to dark brown with gray spots on its back.

During the day adult root weevils hide in loose bark, leaf litter or cracks in the soil, coming out only at night to feed on plant leaves. They do not fly, so they must crawl up plants to chew on the foliage. Adult root weevil damage can be distinguished from the damage of other pests, such as caterpillars loopers, by the characteristic notches they chew on leaf margins. The notches are small, irregular and tend to be concentrated on new growth. The notches may run together on leaf margins creating a jagged-edged appearance.

The larvae of all three species are cream colored, C-shaped with brown heads and no legs. The larvae actively feed on roots of broadleaf evergreens whenever

LARVAE ARE CREAM COLORED AND C-SHAPED WITH BROWN HEADS AND NO LEGS.

they are present. If damage to roots is serious, the plant may look wilted from its inability to absorb water. Damage to roots by larvae is more common in potted plants or if planted in sandy soils.

Root Weevil Life Cycle

Root weevils have four stages in their life cycle: egg, larvae, pupa and adult. They overwinter in the adult or larval stage, the adult being inactive during the coldest winter temperatures. The black vine weevil can be active as early as April or May, but generally they emerge in June or July. The adult obscure weevils generally will emerge in August, with population numbers remaining high through October. The adult woods weevil is similar with population numbers remaining high until November.



Control measures are best directed at the adult prior to egg laying. The adults begin laying eggs 3 to 4 weeks after emerging. Eggs are deposited randomly as the adult travels from plant to plant. Therefore once the adults are first noticed, the gardener has about three weeks to take action.

How To Find Them

The first step in Common Sense Gardening is searching for the emergence of the adult root weevil. The time to actively search for adult root weevils depends on the species. A rule of thumb is to begin as early as April or May. Routine or preventive applications of pesticides before finding any adults may be ineffective and a waste of time and resources.

A simple method of monitoring is inspecting rhododendrons and azaleas after dark with a flashlight. Warm evenings are noted for being a good time for root weevil hunting. The root weevils can be picked off leaves and stems and dropped into a bucket of soapy water. Keep your eyes on new leaves, as they are a favored feeding site.

If you don't like touching insects, lay a white cloth beneath the plant and rustle the plant or strike it with a cushioned stick causing the root weevils to drop onto the sheet. The root weevils can then be collected for identification or dropped into a bucket of soapy water.

If you have a large yard, try trapping. Adult root weevils can be trapped by wrapping stakes with corrugated plastic or cardboard. The wraps should be about 12 inches long and wide enough to circle the stakes with a small overlay. The trap attracts adult root weevils because it mimics the environment in which they hide during the day. No research data is available on exact placement of traps so you may need to experiment. However, placing traps every 10 - 15 feet is recommended. If cardboard is used, remember to remove the smooth paper on one side to expose the corrugated area. The corrugated surface should face toward the inside of the trap. Begin setting traps in April or May, as the temperature warms. Check the traps several times a week by removing the cardboard or plastic and brushing the root weevils off into a bucket of soapy water.

Another trapping method, practiced by some cranberry growers, is to place squares of 1/2 inch plywood on the ground and check under them daily before nightfall. Use a piece of plywood about 2 feet by 2 feet in size.

When To Take Action

Adult root weevil damage does not seriously impair a plant's health. The damage is aesthetic, but it is each gardener's decision how much damage is tolerable. Whatever your decision, it's important to remember that the time to act changes annually. Insects follow temperatures, not calendars.

Determining how much root weevil damage is acceptable may be based on a plant's location. For example, if a prized rhododendron is near a walkway or an entrance where foliage is viewed often, tolerance for damage may be low and require control measures. If a plant is a backdrop and is viewed at a distance, no action may be necessary, since the root weevil damage may not be noticeable. Actively searching is the key to determining if control is necessary and when to time your controls to be effective.

Keeping Root Weevils Under Control

Root weevils can be controlled a number of ways. The alternatives described below are preferred over the use of insecticides. Using effective alternatives decreases our use of insecticides, in turn reducing the potential adverse impacts connected with insecticide production, use and disposal.

Warding Off Problems

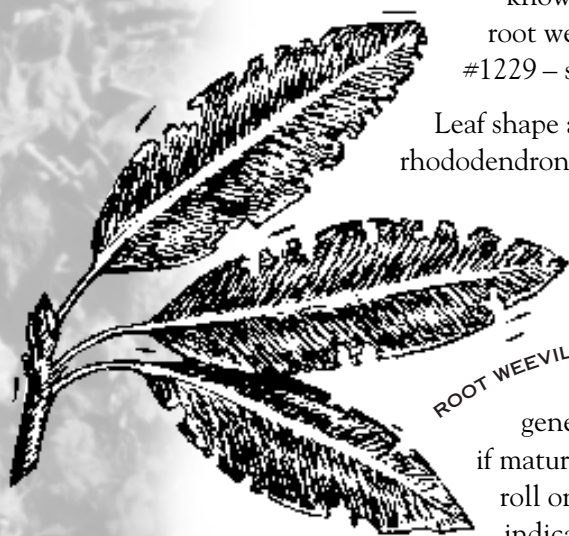
The easiest way to prevent root weevil damage is to plant resistant varieties of rhododendrons and azaleas. Entomologists at Washington State University (WSU) have found many hybrids and species of rhododendrons to be resistant to root weevil damage. On the next page is a list of hybrids

known to be resistant. The list of species resistant to root weevils can be found in the WSU Extension Bulletin #1229 – see further reading.

Leaf shape appears to be a characteristic affecting a rhododendron's resistance. Leaves that have a slight roll on the edges tend to be avoided by weevils because the roll creates an edge too wide for the root weevil's mouth.

So when shopping for rhododendrons or broadleaf evergreens in

general, look to see if mature leaves have a slight roll on the edge. WSU research also indicates rhododendrons with dark red flowers are generally susceptible to root weevil damage.



ROOT WEEVIL DAMAGE GIVES LEAVES A JAGGED-EDGED APPEARANCE.

Hybrid Rhododendrons

The following chart* shows varieties of rhododendrons resistant to feeding by adult root weevils. The higher the number, the less feeding expected. A rating of 100 indicates complete resistance.

HYBRID	BLOSSOM COLORS	RATING
P. J. Mezzitt	<i>pink</i>	100
Jock	<i>pink</i>	92
Sapphire	<i>blue</i>	90
Rose Elf	<i>white, flushed violet-pink</i>	89
Cilpinense	<i>white</i>	88
Lucky Strike	<i>deep salmon-pink</i>	83
Exvury Naomi	<i>lilac-tinged yellow</i>	81
Virginia Richards	<i>chinese yellow with crimson blotch</i>	81
Cowslip	<i>cream, pink</i>	80
Pride of Leonards Lee	<i>rose-pink</i>	80
Vanessa	<i>soft pink</i>	80
Oceanlake	<i>deep violet-blue</i>	80
Dora Amateis	<i>white lightly spotted green</i>	79
Crest	<i>yellow</i>	79
Rainbow	<i>carmine pink</i>	76
Point Defiance	<i>pink</i>	76
Naomi	<i>pink</i>	76
Pilgrim	<i>rich pink</i>	76
Letty Edwards	<i>yellow</i>	76
Odee Wright	<i>yellow</i>	76
Moonstone	<i>yellow</i>	73
Lady Clementine	<i>pink</i>	72
Candi	<i>bright rose</i>	72
Graf Zeppelin	<i>bright pink</i>	71
Snow Lady	<i>pure white</i>	71
Loderi Pink Diamond	<i>delicate pink</i>	71
Faggetter's Favorite	<i>cream with pink</i>	70

* Courtesy of WSU Cooperative Extension

Encouraging Healthy Competition

Root weevil larvae feed on roots and tend to be most active in winter and spring. The larvae tend to cause serious problems in potted plants or plants growing in sandy soils. If you suspect root weevil larvae damage, look at the trunk of the shrub 1/2 inch below the soil. Larval damage will cause girdling of the stem, creating a sawdusty appearance. If this type of damage is visible, apply insect-attacking nematodes.

Insect-attacking nematodes are a biological control affecting both larvae and pupa. Beneficial nematodes are a safe biological control, harmless to humans, pets, birds, earthworms and bees. Parasitic nematodes are microscopic worms that enter the larvae and release bacteria that kills most insects within 24 hours.

Parasitic nematodes require moist soil to move about. If the soil is dry, nematodes will die, so maintaining adequate soil moisture levels is critical. Warm soil temperature is also critical. For nematodes to be effective, the top two to three inches of the soil must have temperatures of 55 degrees Fahrenheit or greater. At lower temperatures, nematodes do not actively seek hosts. Parasitic nematodes are highly sensitive to ultra-violet light. It is best to apply them in the early morning or late evening.

Parasitic nematodes are mixed with water and are applied to the soil as a drench. You can use a watering can, or a pump sprayer if they do not contain fertilizer or pesticide residues. A number of commercial products containing nematodes are available (see resource list). Unmixed nematodes can be stored 5 months, longer if refrigerated. Once mixed, apply nematodes within three hours.



Barriers and Traps

Gardeners can effectively and safely prevent adult root weevils from feeding on foliage by applying sticky barriers to the trunks of susceptible plants. If a sticky band is present, root weevils either become trapped in the sticky material or will not cross the barrier. Usually a 3-inch-wide band is necessary. Sticky barriers such as Tanglefoot or Stick-Em may damage the bark, so snugly wrap the trunk with plastic or other appropriate material and apply the sticky adhesive to the wrapping to avoid any potential problem. Remove any alternative routes to the plant's leaves by pruning off any foliage or stems touching the ground or an adjacent plant, wall or fence. Sticky barriers should be checked twice monthly. Remove or reapply the sticky adhesives if it has an accumulation of insects and debris. Remember to remove the wrapping in late November to prevent restricting the plant's growth.

Sticky barriers can also be used for plants grown in containers. Placing the container on stands and applying the sticky barrier to the legs of the stand or the container itself will effectively eliminate root weevil entry. Also, using plastic strips under the lip of planters or at the base of whiskey barrel planters offers a slippery barrier to egg-laying adults. Teflon tape is another barrier. Teflon tape is used by plumbers and is available at most hardware stores. It usually is available in 1/2-inch-wide bands, so wrap the tape around several times to create a 3-inch band.

The two monitoring techniques discussed earlier—hand picking and trapping—may also be used to control root weevil damage. These traps are effective only if the gardener is diligent in checking several times a week.

Less-Toxic Pesticides

Neem, a new botanical pesticide, is now available for controlling root weevil larvae. For effective control, mix neem with water and thoroughly soak the soil surrounding the infected plant. Neem will cause the larvae to stop feeding, thus stopping the damage immediately, but the larvae do not die quickly. Treatment for root weevil damage can begin in April or May. (See application schedule below). Studies show the warmer the temperatures, the more effective neem will be.

If the use of a conventional insecticide is chosen, read the label carefully and apply only at recommended rates. Mix only the amount of insecticide needed, apply only on individual plants as needed and wear protective clothing to reduce your exposure.

The most effective time to treat adult weevils is before they lay eggs. Unfortunately, most insecticide labels advocate monthly routine applications. However, Washington State University scientists suggest that two applications of insecticide are effective, the first application made approximately one week after the first adults are observed. The second application should be made three to four weeks later, to kill any late-emerging adults prior to egg laying.

Waste Reduction

Common Sense Gardening encourages gardeners to conserve water, to use alternatives to pesticides and to choose less-toxic pesticides when necessary. Reduction of household hazardous waste, such as pesticides and synthetic fertilizers is the highest priority in Thurston County's Hazardous Waste Program.

By taking action to reduce the use of pesticides and synthetic fertilizers and conserve water, Common Sense Gardeners are protecting our lakes, streams, rivers and Puget Sound. Gardeners with outdated, banned or restricted pesticides can safely dispose of them free at HazoHouse, Thurston County's household hazardous waste collection center. For more information, please call the Thurston County Wasteline at 360-754-4348, or the TDD line for the hearing impaired, 360-754-2933 during regular business hours.

For more information about Common Sense Gardening, call Thurston County Community and Environmental Programs at 360-754-4111.

Further Reading

Antonelli, Art and Campbell R.L. *Root Weevil Control in Rhododendrons*. WSU Extension Bulletin #0970.

Antonelli Art; Byther R.S.; Collman, S.J.; Davidson, A.D.; and Maleike, R.R. *How to Identify Rhododendron and Azalea Problems*. WSU Extension Bulletin # EB1229.

Daar, Sheila. *IPM for the Black Vine Weevil on Ornamental Plants*. The IPM Practitioner, Vol. 8. No. 5/6, May/June 1991. Published by the Bio-Integral Resource Center, P.O. Box 7417, Berkely, CA 94707; 415-524-2567.

Resources

Many products suggested in this guide are available locally. Check your favorite local nursery. The following list provides other resources for alternative products.

PARASITIC NEMATODE PRODUCERS:

Biosystems

1057 East Meadow Circle, Palo Alto, CA 94303; 800-821-8448.

Gardens Alive

5100 Schenley Place, Lawrenceburg, IN 1-812-537-3179.

Web Sites

Integrated Pest Management Practitioners Association
www.efn.org/ipmpa

Washington Toxics Coalition (a non-profit organization)
www.watoxics.org

WSU, Cooperative Extension Gardening in Western Washington
www.gardening.wsu.edu

WSU, Pesticide Education Project
www.pep.wsu.edu



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