GD 36

Cedar-Apple Rust and Related Rusts

by the Vermont Master Gardener Program

Cedar-apple rust and two closely related diseases, cedar-hawthorn rust and cedar-quince rust, are caused by fungi belonging to the genus *Gymnosporangium*. These fungi require two different living host plants in order to complete their life cycles. If either host plant is not present, the fungus dies. Juniper, including the commonly affected eastern red cedar, is one host while alternate hosts include apple, crabapple, hawthorn, and quince.

Symptoms

Cedar-apple rust. In early summer, small yellow spots appear on the upper-leaf surface of infected apple and crabapple trees. The spots rapidly enlarge, becoming a brilliant yellow-orange-red color. These spots can cause loss of leaves if infection is severe. With time, usually later in the summer, the undersides of these spots produce hair-like tendrils bearing spores. Fruit symptoms are similar to leaf symptoms and occur on the calyx (blossom) end. The spots are superficial, extending ¼ inch or less into the fruit.

Infected red cedars and junipers form chocolate-brown galls, generally the size of a half-dollar, or infected twigs. They may be smooth or dimpled like a golf ball. In early spring, finger-like orange tendrils (spore horns) emerge from the galls. The horns have a gelatinous (jelly-like) texture, and it is from these structures that spores are produced. These galls maintain their bright-orange color for two to three weeks, then dry and wither.

Cedar-hawthorn rust. The leaf spot color on hawthorns is similar to that of cedar-apple rust, but may be slightly smaller in size. The galls on juniper are seldom over ½ inch across and produce horns for three to five years.

Cedar-quince rust. The infection on quince occurs only on the fruit and not on the leaves. The fungus produces cylindrical galls (cankers) rather than round galls on junipers. These galls are perennial, increasing in size from year to year. They may remain active for up to 20 years.

Life Cycle

During rainy, wet weather in the spring, spore horns develop from galls on infected junipers. Spores are spread via wind and rain to leaves on apple and crabapple trees. Infected leaves will develop obvious yellow-orange-red spots apparent from both the upper and lower leaf surfaces. In late summer, hair-like tendrils develop on the underside of infected leaves. Spores from these tendrils spread to susceptible junipers and infection occurs. The fungus grows within juniper twig tissue for approximately 20 months, forming an enlarging gall on the twig.

Cedar-hawthorn rust and cedar-quince rust have similar life cycles to cedar-apple rust.

Control

The rust fungi are dependent upon both the juniper host and the alternate (apple, crabapple, hawthorn, or quince) hosts for survival. Removal of one or the other breaks the life cycle of the fungus, preventing disease. A distance of ¼ mile between junipers and alternative hosts is helpful.

In late winter, remove and destroy galls on junipers.

Usually, rust does not cause sufficient injury to warrant fungicides. If it is a chronic problem, causing leaf drop and poor tree vigor, registered fungicides may be used on apples, crabapples, hawthorn and quince. This should be done at 7-10 day intervals when juniper galls are producing spore horns. When spring weather is dry, fungicide applications are generally not required.

Plant less susceptible varieties, such as these listed below. (For more selections, zone information and tree descriptions, refer to *Landscape Plants for Vermont*, page 79.)

'Adams'
M. baccata 'Jackii'
'Bob White'
'Dolgo'
'Donald Wyman'
M. floribunda, Japanese flowering
'Indian Summer'
'Liset'
'Mary Potter'
'Mount Arbor'
'Prairifire'
'Professor Sprenger'
'Profusion'
M. sargentii, 'Tina'
Red Jewel
'Sutyzam' (Sugar Tyme r)
M. zumi 'Calocarpa'

Reviewed and edited in July 2003.

Contact the Vermont Master Gardener Program at 1-800-639-2230 or www.uvm.edu/mastergardener

Visit University of Vermont Extension on the Web at www.uvm.edu/extension

---

Warning! All pesticides are poisons. Use them only as a last resort!

Before using any insecticide, herbicide or fungicide: 1) Know your problem. Positively identify the insect or disease. 2) Monitor the problem. Is treatment necessary? 3) Use non-chemical cultural controls first. 4) If you must use a chemical control, *carefully follow all directions and safety precautions on the label*!
