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Hawthorn Rust Diseases

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Hawthorns (*Crataegus*) are widely used as small landscape trees. They are selected for their showy spring flowers and seasonal red to orange fall fruit. Hawthorn has a reputation as a tough tree, tolerant of a wide range of growing conditions, but some selections are very susceptible to disease problems.

Hawthorn is host to at least nine different rust fungi. Cedar-hawthorn rust caused by the fungus *Gymnosporangium globosum* and cedar-quince rust caused by the fungus *Gymnosporangium clavipes* are the most common. Two host plants, one in the cypress family and one in the rose family, are needed to complete the life cycle of these fungal pathogens.

With hawthorn rust diseases, the alternate hosts are primarily ornamental junipers and eastern red cedar. Fungal spores produced on the juniper in early spring can only infect the hawthorn while spores produced on the hawthorn in summer can only infect and overwinter on a juniper host.

Figure 1: Jelly-like rust gall on juniper

Symptoms

On juniper twigs, either a dark brown spindle-shaped woody gall (quince rust) or quarter-inch reddish-brown round gall (hawthorn rust) is formed. In the spring these galls more than double in size by producing eye-catching masses of orange jelly-like material, which are actually structures bearing millions of spores (Figure 1).

These rust diseases usually cause minor damage to the juniper host (some needle and twig dieback). Most concern is over the damage done to hawthorn and other hosts in the rose family.

Cedar-Hawthorn Rust

Cedar-hawthorn rust most often infects leaves and may lead to premature leaf drop. The bright yellow leaf spots can make an entire plant appear off-color (Figure 2). Hawthorn rust may form spindle-shaped galls on young, expanding shoots, and it may also infect the fruit (Figure 3).

Figure 2: Symptoms of cedar-hawthorn rust on hawthorn

Figure 3: Symptoms of cedar-hawthorn rust on hawthorn

Cedar-Quince Rust

Cedar-quince rust affects primarily fruit, green stems, and leaf petioles. Infected fruit and shoots may even be killed. On green stems and petioles, a spindle-shaped swelling up to two inches in length is formed. These woody galls and the infected fruit become covered with prominent yellow-orange tubes of the fungus. These tubes produce fungal spores that can infect juniper and complete the life cycle.

Table 1: Select resistant hawthorn varieties (*Crataegus* spp.) when installing new plantings

Resistant Hawthorn Varieties
Washington hawthorn, *C. phaenopyrum*
Copenhagen Hawthorn, *C. intricata*
English Hawthorn 'Autumn Glory', *C. laevigata*
Waxy-fruited Hawthorn, *C. pruinosa*
Lavalle Hawthorn, *C.* x *lavalleei*
Cockspur Hawthorn, *C. crus-galli*
Green Hawthorn 'Winter King', *C. viridis*
Morden Hawthorn, *C.* x *mordenensis**

* Highly susceptible to damaging leaf blight caused by the fungus *Entomosporium*.

Disease Prevention and Control

A program of hawthorn rust management is made up of two primary components--protective fungicide treatments and selection of disease-resistant varieties (Table 1). Elimination of juniper from an area can reduce disease and is a measure used in commercial apple growing regions, but is neither a realistic nor desirable practice in urban landscapes. Close placement of the two hosts can, however, increase the severity of the disease.

When dealing with susceptible hawthorn varieties, properly chosen and timed fungicide treatments will do an excellent job of managing rust diseases, keeping your plants healthy and attractive. Results from research performed at the Bartlett Tree Research Laboratories found that good disease suppression is generally obtained when fungicide treatments are appropriately applied.

Proper cultural practices are still the cornerstone of any management program to help trees and shrubs deal with stress imposed by insect and disease attack. Therefore, proper mulching, irrigation, soil nutrient and pH management are important in both preparing plants to deal with future injury and helping plants recover from stress.

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