

Apple Cedar Rust

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With the wet weather we have been having be on the look out for Cedar-apple rust. Cedar-apple rust is just one of several similar fungal diseases, which could be broadly classified as Juniper-Rosaceous rusts. All of these rusts have very similar disease cycles but differ in exactly which juniper and rosaceous species they infect. The fungus spends part of its life cycle on a juniper host and part on a host in the rose family. It requires both hosts to complete its life cycle. All of these rust diseases are caused by species in the genus *Gymnosporangium*. Cedar-apple rust is caused by the fungus known as *Gymnosporangium juniperi-virginianae*. Two other common juniper-rosaceous rusts are hawthorn rust and quince rust, although there are many more.

Examples of juniper hosts include eastern red cedar, southern red cedar, Rocky Mountain juniper, some prostrate junipers, and Chinese juniper. Examples of rosaceous hosts are apple, crabapple, hawthorn, quince, serviceberry, and pear. Some commercial apple varieties are highly susceptible to cedar-apple rust with both direct fruit infection and defoliation of infected leaves.

Characteristic symptoms of a rust infection include bright orange colored growths emerging from the swollen woody tissue or galls, I often refer to this as an orange jello looking substance. On leaves, lesions may be found on the surface or underside of the leaves depending on the spore stage present. These lesions often also have that bright orange coloration which is very distinct. This occurs after moist weather, which we have been having the last couple of weeks. Since we have not had many wet springs we have not noticed apple cedar rust, but this year it is in full form.

On apple and crabapple, bright orange-yellow leaf spots develop on upper surfaces of leaves in late spring followed by light colored, fringed cup-shaped structures on lower leaf surfaces several weeks later. Damage on junipers is generally minor and involves presence of the galls and twig dieback. On apples and crabapples, fruit infections and leaf drop also can occur.

The alternating host plant is necessary for survival of the fungus. Spores produced on the juniper host are transmitted to the rosaceous hosts in mid-spring and develop and then in late summer or early fall the spores are transmitted back to junipers. Windborne spread of spores between the hosts can be a matter of miles.

Protective fungicides can be applied several times starting with pre-bloom on hawthorn and bud break on crabapples if the disease is chronically a problem at a given site. These applications are to protect the plant from spores being disseminated from the juniper host in mid-spring. Since there is no repeating cycle of this disease on the rosaceous host, further applications after this springtime spread from juniper are unnecessary. However spraying junipers in late summer will keep the disease from infecting the junipers. Commonly recommended fungicides include:

Mancozeb (Fore, Dithane, Mancozeb); Chlorothalonil (Daconil*); Triadimefon (Bayleton, Strike) and propiconazole (Banner). To protect the juniper host from spores being disseminated from the rosaceous host spray them in late summer and fall.

When you diagnose cedar rust disease on a plant it is far too late to spray for that year, all sprays need to be preventative. In most cases there is not the opportunity to eliminate one of the host plants since the spores can travel quite a distance. The rust galls can be trimmed off, which will help in the spreading of the disease. I have found that typically where the rust forms on juniper branches they will die from that point out to the end of the branch.

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