

JUNIPER-HAWTHORNE & CEDAR-APPLE RUSTS

(*GYMNOSPOANGIUM JUNIPERI-VIRGIANAE* & *G. GLOBOSUM*)



What is Rust Fungus?

Cedar-apple rust (*Gymnosporangium juniper-virginianae*) & cedar-hawthorn rust (*G. globosum*) are closely related fungal rust diseases that require two hosts to complete their life cycle. Both rusts can infect cedar as well as junipers and a specific deciduous alternate host (apples, crabapples and many hawthorns, sometimes pears, and saskatoon).

The rust organism spends one full year of its life cycle on junipers/cedars. During the second spring, usually around the time crabapples are in bloom, galls on the infected juniper/cedar become rain soaked and swell, producing jelly-like tendrils (spore horns) that project out of the galls. As the spore horns begin to dry, the spores are released and carried by the wind or insects to the leaves of nearby susceptible, newly developing leaves of hawthorns & apples. About a month after crabapples have bloomed, the spores are exhausted and most leaves are no longer susceptible.

The spores then turn brown, infect the leaf tissue. Ten-to-14-days from initial infection of the hawthorn/apple, small yellow spots can be seen on upper surfaces of infected leaves. Several weeks later, the fungus appears as orange or brown spots with hair-like appendages on the underside of the leaf. In the late summer, spores are produced on the hawthorn/apple tree's leaves. They are windblown back to needle bases or cracks in juniper/cedar twigs and infect juniper/cedar leaves from mid-summer into autumn. The disease overwinters as galls on infected junipers/cedars, thus completing the cycle. It takes two years to produce a spore-bearing gall.

Cedar-apple rust cannot spread from apple/hawthorn to apple/hawthorn or from cedar/juniper to cedar/juniper - the fungus must go through the two-year life cycle, alternating between hosts.

Spores travel a maximum distance of 6-8 km, but most infections occur when alternate hosts are within a few hundred meters.

Signs & Symptoms of a Rust fungus infection:

On Hawthorn & Apples:

- Symptoms begin to appear on the upper surface of hawthorn/apple leaves shortly after bloom. Small, pale yellow spots appear on the upper surface of leaves and on fruit.
- Orange or brown spots with hair-like appendages on the underside of hawthorn/apple leaves.
- Eventually, small black spots appear within the center of the lesions. The lesions grow larger and more orange-coloured, often with a red margin.
- In late summer, cup-like structures appear on the undersides of leaves and on fruit. These structures release spores carried on the wind to junipers/cedars.

On Juniper & Cedars:

- In mid-spring, swellings or galls develop on juniper needles that were infected with spores during the previous year. These galls are brown to dull red in color, globular in shape, and may vary from pea-sized to an inch or more in diameter.
- Jelly-like tendrils (spore horns) that projecting out of galls on branches of juniper/cedar plants in spring, usually during wet weather.
- Orange gelatinous material, which contains thousands of spores, oozes out of galls present on affected branches.

Control of Rust Fungus infections:

Theoretically, it is desirable to remove alternate hosts of rust diseases from the vicinity. In reality, this is usually not practical.

- Avoid planting the alternate hosts close together. If possible, remove susceptible plants from the vicinity.
- Separate the hosts. The rust fungus cannot survive in the absence of one of the hosts.
- Junipers should be carefully inspected during each dormant season and any gall tissue should be pruned and destroyed before the spore horns develop.
- In most cases in the landscape, damage to either host is not severe enough to warrant chemical fungicide applications. Fungicide sprays are available but seldom are necessary.
- Early application of lime sulphur and/or dormant oil are good preventative measures but will not reverse or hinder infections already present.
- Natria, Serenade, Defender or other BT fungicides are affective preventative fungicides but again will not reverse infections already present.

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Referances:

<https://www.missouribotanicalgarden.org/gardens-gardening/your-garden/help-for-the-home-gardener/advice-tips-resources/pests-and-problems/diseases/rusts/cedar-hawthorn-rust.aspx>

<https://www.arborcare.com/blog/juniper-hawthorn-rust>

https://static.colostate.edu/client-files/csfs/pdfs/juniper_hawthorn.pdf

<https://web.extension.illinois.edu/focus/index.cfm?problem=cedar-hawthorn-rust>

<http://www.omafra.gov.on.ca/english/crops/facts/cedarap.htm>

<https://www.mortonarb.org/trees-plants/tree-and-plant-advice/help-diseases/cedar-apple-rust>



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