



Extension

UNIVERSITY OF WISCONSIN-MADISON

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## Red Star Rust

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**What is red star rust?** Red star rust (also known as Japanese apple rust or lipstick rust) is a type of Gymnosporangium rust (see UW Plant Disease Facts D0012, *Gymnosporangium Rusts*). The disease affects junipers [specifically Chinese junipers (*Juniperus chinensis*), flaky juniper (*Juniperus squamata*), Hollywood juniper (*Juniperus chinensis* var. *kaizuka*), Japanese garden juniper (*Juniperus procumbens*), Sargent juniper (*Juniperus chinensis* var. *sargentii*), and savin juniper (*Juniperus sabina*)], as well as apple and crabapple trees (*Malus* spp.). The disease is native to Asia (in particular China, Korea and Japan) and was first detected in the US in Delaware and Pennsylvania in 2008. Red star rust was observed in Wisconsin in 2021 and to date has been found in Dane, Kenosha, Milwaukee, Outagamie, Ozaukee, Portage, Racine, and Walworth Counties. Red star rust is of concern because of its potential negative impact in commercial apple production.



A slimy, orange, gelatinous red star rust gall on a juniper branch (left). Red/maroon/fuchsia-colored red star rust spots on crabapple leaves (right). (Photo courtesy of Nancy Gregory, University of Delaware)

**What does red star rust look like?** On junipers, red star rust leads to branch swellings or small-diameter galls that sprout  $\frac{1}{8}$  to  $\frac{3}{8}$  inch long, flattened, orange, gelatinous protrusions in late spring to early summer. The galls/swellings and gelatinous masses can be confused with those produced by cedar-hawthorn and cedar-quince rust (see UW Plant Disease Facts D0012, *Gymnosporangium Rusts* for details).

On apples and crabapples, red star rust typically leads to bright red, maroon, or fuchsia-colored leaf spots that become readily visible by mid-summer. Yellow or orange spots surrounded by a red, maroon, or fuchsia margin have also been reported for the disease. Beneath the colorful leaf spots, numerous spiny or tendril-like structures form. Red star rust leaf spots are similar to cedar-apple and cedar-hawthorn rust leaf spots except for their color; cedar-apple rust and cedar-hawthorn rust leaf spots tend to be solid yellow or orange.

In Asia, red star rust can cause severe defoliation of apple trees. Infections on apple fruits are rare.

If you see what you believe is red star rust, please contact the UW-Madison Plant Disease Diagnostics Clinic at (608) 262-2863 or [pddc@wisc.edu](mailto:pddc@wisc.edu) to make arrangements to submit a sample for a free diagnosis. Samples will be used to determine how widespread the disease is in the state.

**Where does red star rust come from?** Red star rust is caused by the fungus *Gymnosporangium yamadae*. The fungus overwinters in infected branches and galls on junipers.



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Spores produced in the gelatinous masses on infected branches and galls spread on air currents to apple and crabapple trees leading to leaf infections. Similarly, spores produced in the tube-like spines on apple and crabapple leaves drift to junipers leading to new branch infections and additional gall formation.

**How do I save a tree or shrub with red star rust?** On junipers, prune infected branches to remove the disease. Cut four to six inches below visible galls or areas on a branch that appear to be infected. Be sure to decontaminate pruning tools between cuts by treating them for at least 30 seconds in 70% alcohol (e.g., rubbing alcohol or certain spray disinfectants) or 10% bleach. Decontaminating tools will prevent movement of rust fungi from branch to branch or from plant to plant during pruning. If you use bleach, be sure to thoroughly rinse and oil your tools after pruning to prevent rusting. You can burn (where allowed) or bury pruned branches, or drop them off at your local yard waste disposal site.

Once infections occur on apple and crabapple leaves, there is no cure. Fortunately, cases of red star rust on apple and crabapple trees observed thus far in Wisconsin have not been severe. Damage to apple and crabapple trees has been primarily cosmetic, making trees less attractive but not causing significant leaf loss or yield loss (in fruit-bearing apple trees). No long-term detrimental effects due to the disease have been observed in Wisconsin at this time. All of this said, the negative impacts of red star rust may change as the disease becomes more established and widespread in the state, and during years with wetter weather.

**How do I avoid problems with red star rust in the future?** The best way to avoid red star rust is to not grow junipers and apples or crabapples close to one another. In urban settings where yards are small however, keeping both hosts adequately separated may be impossible. Also, Chinese junipers have become increasingly common in many landscape settings because of their resistance to other *Gymnosporangium* rusts (i.e., cedar-apple rust, cedar-hawthorn rust, cedar-quince rust). If red star rust becomes a serious problem in your area, consider growing evergreens (e.g., pine, fir, spruce) and flowering trees and shrubs (e.g., cherry, plum, lilac) that are immune to the disease.

In Asia, commonly grown apple varieties differ in terms of their susceptibility to red star rust. Apple varieties grown in Wisconsin likely also differ in susceptibility. However, which apple varieties commonly grown in Wisconsin may be resistant (and to what extent) is not known. Also, while fungicides treatments are available to control cedar-apple rust, cedar-hawthorn rust, and cedar-quince rust (see UW Plant Disease Facts D0012, *Gymnosporangium Rusts* for details), how effective these treatments might be in controlling red star rust is also not known.

**For more information on red star rust:** Contact the University of Wisconsin Plant Disease Diagnostics Clinic (PDDC) at (608) 262-2863 or [pddc@wisc.edu](mailto:pddc@wisc.edu).

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A complete inventory of UW Plant Disease Facts is available at the University of Wisconsin-Madison Plant Disease Diagnostics Clinic website: <https://pddc.wisc.edu>.

Submit additional lawn, landscape, and gardening questions at <https://hort.extension.wisc.edu/ask-a-gardening-question/>.