



Rust on Ornamentals

O & T Guide OD-7

Natalie P. Goldberg
Extension Plant Pathologist



Cooperative Extension Service • College of Agriculture and Home Economics • October 2006

Hosts: Rust on ornamentals is caused by a number of different, but closely related, species of the rust fungi. A wide range of plants can be infected by rust fungi, but individual rust fungi have a very limited host range. In New Mexico, some of the more commonly affected ornamentals species include cottonwood, crabapple, desert broom, geranium, hollyhock, juniper, New Mexico privet, oak, pennstemon, periwinkle, pine, rose, snapdragon, and willow. Daylily rust, a newly emerging rust disease problem in the United States, has also been found in New Mexico.

Life Cycles: Some rust species have complex life cycles and others have simple life cycles. Rust fungi may have up to five different spore stages in their life cycle. Rusts may be autoecious (having only one host) or heteroecious (having two hosts). Heteroecious rusts need both hosts to complete its sexual life cycle, although the infection can build on one host through asexual reproduction. When two hosts are required to complete the life cycle, spores from one host infect the other host and vice versa. With this type of rust disease, one host is often considered the “economic host” (the desirable plant) and one is called the “alternate host.” In some cases, such as apple-cedar rust, both hosts are desirable hosts. Weeds often serve as the alternate host, especially for pine and oak.

Symptoms: The most common symptom of rust infection is the production of powdery pustules on the leaves, stems, twigs, flowers and fruit of susceptible plants. Pustules are most common on the lower leaf surface and stem. Pustules may be bright yellow, orange, orange-red, reddish brown, chocolate brown, or black in color. Pale yellow to orange spots may appear on the upper surface of infected leaves. These spots enlarge and may coalesce as the infection builds. Rusted leaves often turn yellow, die, and drop prematurely. If the infection is severe the plant may become stunted and exhibit an overall unthrifty appearance. The presence of spore pustules is a diagnostic sign of rust infection. Rust on junipers, especially red cedars, has a completely different look. It appears as green, then reddish brown, round to kidney-shaped, corky galls on the twigs. Yellow to orange, gelatinous tendrils protrude from the galls during spring rains.



Rose rust (note yellow lesions on upper leaf surface and pustules on the lower leaf surface). Photo: J. K. Clark, University of California.



Cedar-apple rust on juniper (top) and apple (bottom). Photos: The Ohio State University (top) and Kansas State University (bottom).



Geranium rust. Photo: D. S. Mueller, Iowa State University.



Hollyhock rust. Photo: University of Minnesota.



Daylily rust. Photo: D. S. Mueller, Iowa State University.

Conditions for Disease: Rust fungi infect only the plant's aboveground parts, and while rust fungi generally do not directly kill their host plants, severe infections ultimately may lead to death by other factors (winter-kill or other diseases). Rust fungi overwinter as spores or mycelia in infected plants and plant debris. Some spores produced by rust fungi can be carried several hundred miles in wind currents. Spores are also moved short distances by wind, insects, rain, and animals. Water on the plant surface is required for spore germination and infection. After the plant is infected, water is not needed for continued disease development. Rust diseases are favored by moderate temperatures.

Management: Rust fungi may be managed by the integrated use of several different management practices:

- Depending on the host, tolerant varieties may be available.
- Plant disease-free plant material.
- Space plants appropriately to allow for good air circulation and rapid drying of the foliage.
- Avoid wetting foliage
- Remove infected bedding plants and other annuals.
- Avoid planting the same species in locations where rust has been a problem.
- Prune out infected portions on perennial hosts.
- Remove and destroy infected plant debris.
- Destruction of the alternate weed host for some heteroecious rusts may help to reduce the disease.
- Contact and systemic fungicides may help to reduce or prevent disease.

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