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# Hollyhock disorder: Rust

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Rust is a fungal disease that invades hollyhock leaves and stems. It is extremely common throughout Wisconsin. Fortunately, the disease does not usually destroy its host, though the foliage may become unattractive in wet years. We can usually enjoy colorful hollyhocks in spite of the disease.

## Symptoms and effects

Lower leaves show the symptoms of hollyhock rust first, and the disease progresses upward during the growing season. Its extent and severity depend on weather conditions.

Symptoms appear on the leaves as individual yellow spots, which are circular and about  $\frac{1}{8}$  inch in diameter at first. The spots grow to  $\frac{1}{4}$  inch or

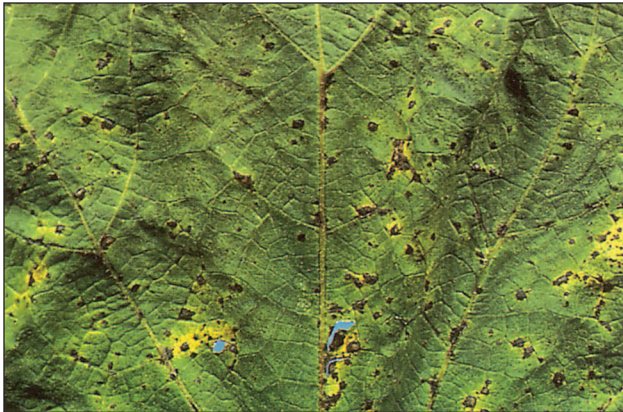
more in diameter, and on the underside of the leaves, swellings or blisters soon emerge within the spots. At this stage the symptoms resemble the insect or mite galls found on many other plants; however, such galls are rare on hollyhock. The swellings continue to develop, and within a few days they release masses of reddish-brown spores, which cover the entire undersurface of the leaf.

The round blisters covered by loosely attached, red spores make the disease easy to identify in the field. Rust spots may also occur on the stems and petioles (leaf stalks) and occasionally on green flower parts. Leaves that are heavily infected eventually turn gray or tan and die.

Another leaf spot disease in Wisconsin may be confused with rust. Believed to be caused by a bacterium, this disease produces small leaf spots of similar size but more angular in shape than the round rust spots. The disease produces no conspicuous spores.

## Cause

The fungus *Puccinia heterospora* causes hollyhock rust. Its reddish spores are easily spread by splashing rain and wind. The fungus overwinters in plant debris and—possibly—in live, overwintering plant tissue. Symptoms will appear very early the following spring when the weather is warm with rain or high humidity.



The upper and lower surfaces of a diseased hollyhock leaf. Most of the circular swellings are covered with red or brown fungal spores, although the spores have not yet erupted through the surface of a few blisters.



**Control****Cultural**

Cultural methods probably will not control rust completely, but they may be adequate for most gardens.

Producers who use disease-free plants or who start plants from seeds and place them some distance from infected stock can expect a healthy bed for a time. This is especially true if plants are well-spaced in a dry, sunny location. However, because the spores are numerous and can travel widely, infection may occur anyway. It will also help to maintain the plants in a vigorous growing condition through a good fertility program and irrigation during dry periods.

Sanitation is recommended.

Remove old plant materials and plow them under, burn them, or compost them at the end of the flowering season. It may also help to pick off the first infected leaves as they appear in an essentially disease-free area.

However, this practice often is not successful in controlling rust.

Destroy common mallow weeds in the vicinity because they may host the rust disease and become a source of hollyhock infection.

**Chemical**

If you want the most attractive hollyhocks possible, consider using fungicides to supplement cultural methods of rust control. No information is available on the effectiveness of specific chemicals against hollyhock rust, but several chemicals are registered for control of the disease. These include Bayleton, ferbam, mancozeb (Dithane M-45, Fore, Manzate 200, or Protect T/O), sulfur, Systhane WSP, and zineb. All except Bayleton are protective fungicides—that is, they prevent rather than eradicate the fungus.

Start using a fungicide at the first sign of disease development. Apply the fungicides primarily to the lower surface of the leaves. Make the treatments at approximately 10-day intervals, during rainy periods or when heavy dews persist into mid-morning or later.

Take care to avoid overapplying Bayleton. It is a systemic fungicide that may stop more advanced infections, but it can dwarf plants that are treated excessively.

References to products in this publication are for your convenience and are not an endorsement or criticism of one product over other similar products. You are responsible for using chemicals according to the manufacturer's current label directions. Follow directions exactly to protect the environment and people from chemical exposure.



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