



HOLLYHOCK RUST

Rust caused by the fungus *Puccinia malvacearum* is the most common and widespread disease of hollyhock (*Althaea rosea*). Hollyhock rust was first reported in 1852 in Chile, where it is indigenous. In 1857 it was observed in Australia, and in 1869 in Spain, from where it spread rapidly over the rest of Europe. By 1875, rust was reported in South Africa, and it reached the United States in 1886. Today, the disease occurs worldwide.

Severely rusted leaves turn yellow, wither, and drop prematurely. Ragged and unsightly plants result, but hollyhocks infected with rust are rarely killed. It is not uncommon to find the disease severe in the spring and autumn but declining in midsummer, especially during drought periods.

The same rust fungus attacks about fifty species in ten genera of the mallow family (Malvaceae) including species of *Althaea*, *Brotex*, *Kitaibelia*, *Lavatera*, *Malope*, *Malva*, *Malvastrum*, and *Sidalcea*. Rust is prevalent on common or roundleaf mallow (*Malva rotundifolia*), a common weed closely related to hollyhock.

SYMPTOMS

Rust first appears primarily on the undersides of the lower leaves as lemon yellow to orange, almost waxy pustules (or sori) that turn reddish brown to chocolate brown with age. Larger, bright yellow to orange spots with reddish centers develop on the leaf surface opposite the pustules. The rust quickly spreads to other leaves, which become covered with small, reddish brown to chocolate brown pustules. These pustules, filled with thousands of microscopic dark brown spores (teliospores), appear primarily on the underleaf surfaces, but they may appear to a lesser extent on the upper side of the leaves or on the petioles, stems, and flower bracts (Figures 1 and 2).



Figure 1. Hollyhock rust pustules (sori) on the upper and lower sides of hollyhock leaf.



Figure 2. Hollyhock rust pustules on hollyhock stem.

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DISEASE CYCLE

The rust fungus overseasons as mycelium within tender young shoots and as mature hibernating teliospores on living or dead tissue and on the seeds or bracts infected the previous growing season. In the spring, the rust fungus produces large numbers of spores (teliospores and basidiospores), which are carried by air currents and splashing rains to living host tissue where direct infection occurs through the cuticle and subcuticular wall. For 8 to 10 days the mycelium of the rust fungus spreads through the hollyhock tissue. Then, a mycelial cushion forms under the epidermis and grows until it erupts through the epidermis, producing teliospores continuously even while older teliospores in the same sorus are germinating. New crops of teliospores soon appear, and these may germinate immediately and infect healthy hollyhock or other host tissues. In humid weather, rust continues to spread from leaf to leaf until the entire hollyhock plant becomes infected and loses its leaves one by one.

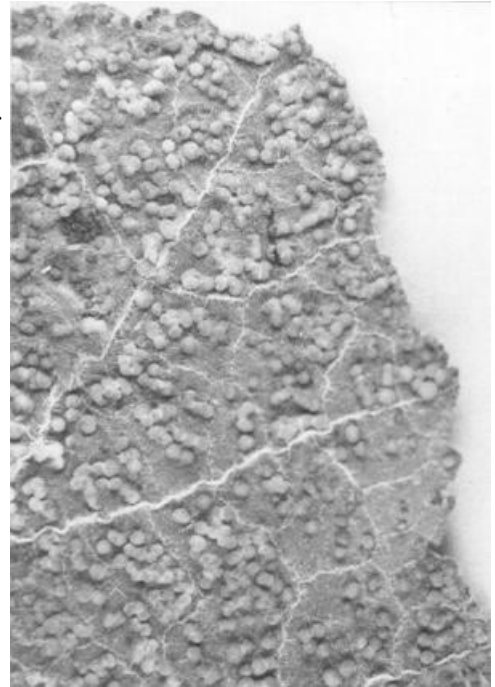


Figure 3. Closeup of rust sori on hollyhock leaf undersurface. (Courtesy Dr. T.M. Sjulín)

The rust fungus is microcyclic, producing only teliospores and basidiospores. No pycnia, aecia, and uredia are formed. Physiological specialization in the fungus is unknown. Reciprocal cross-inoculations of the rust may be made between species of *Malva* and *Althaea* and probably other genera as well.

CONTROL

1. As soon as flowering is over, all rust-infected hollyhock leaves and stalks should be collected and then destroyed by burning, burying in a compost pile, or hauling away with the trash. The plants should be cut off at the soil line, and the stalks and all the fallen leaves should be removed.
2. All common or round-leaf mallow (*Malva rotundifolia*) plants should be removed and destroyed. The rust fungus may survive the winter on this common weed and infect nearby hollyhocks in the spring and early summer.
3. The first rusted leaves in the spring should be picked off and destroyed.
4. Rust may be effectively prevented, where sanitation measures are insufficient, by spraying or dusting the plants with a fungicide, starting when new growth commences in the spring. All aboveground parts of the plants should be covered with a fine mist or dust. Make 5 or 6 applications 7 to 10 days apart. Apply sprays using 1½ level tablespoons of fungicide per gallon of water. Follow the manufacturer's directions as printed on the container label. Check the latest Illinois Homeowners' Guide to Pest Management for recommendations. This publication is available at your nearest Extension office.