



ORANGE RUST OF BRAMBLES

Orange rust is the most important of several rust diseases that attack brambles. Orange rust in the Midwest is caused by the fungus *Arthuriomyces petkianus*. All varieties of black and purple raspberries and most varieties of erect blackberries and trailing blackberries are susceptible to orange rust. Orange rust does not infect red raspberries. The orange rust fungus grows systemically throughout the roots, crown, and shoots of an infected plant and is perennial inside the below-ground plant parts. Once a plant infected by orange rust, it is infected for life. Orange rust does not infect red raspberries. Orange rust rarely kills plants but causes them to be stunted and weakened so that they produce little or no fruit.

SYMPTOMS

Orange rust is easily identified shortly after new growth appears in the spring. Newly forming shoots are weak and spindly. Leaves on such canes are stunted and misshapen and pale green to yellowish. Within a few weeks, the lower surface of infected leaves are covered with blister-like pustules (sori) that are initially waxy but turn powdery and bright orange (Figure 1). These "rusted" leaves wither and drop by early summer.

Young, apparently healthy canes, with normal leaves can be found toward the end of June. Unfortunately, diseased plants are systemically infected, and the fungus is present in the roots, canes, and leaves. Shoots of rust-infected plants are normally too weak to form rooted tips, which limits cane growth and spread. Infected canes will be bushy and spindly, and will bear little or no fruit in the following season (Figure 2).

DISEASE CYCLE

In midspring, masses of bright orange spores (aeciospores) are produced on infected leaves and dispersed by wind. These spores contact susceptible leaves, germinate, and infect leaves, if the environmental conditions are favorable. The fungus sends out branching filaments (hyphae) which produce food-absorbing organs (haustoria) within soft-walled parenchyma cells. The rust fungus gradually spreads throughout the canes and runners until the entire plant is infected.

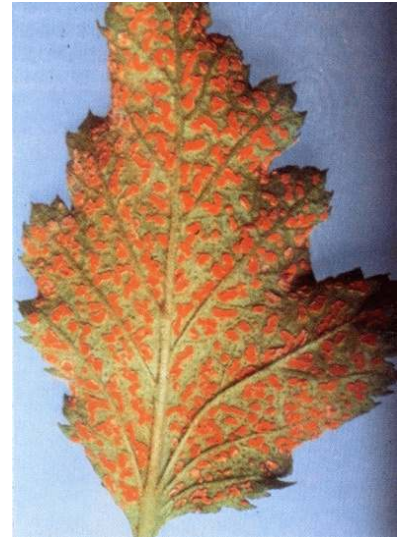


Figure 1. Blisterlike aecia covering lower surface of black raspberry leaf affected by orange rust (courtesy L.V. Madden and S. Heady).

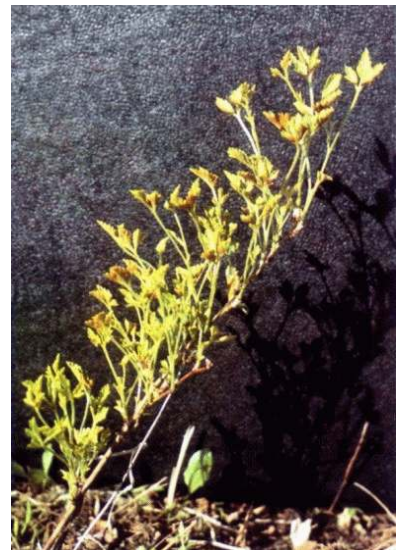


Figure 2. Early-season symptoms of orange rust. Note proliferation of weak, spindly shoots from infected black raspberry floricanes in early spring (courtesy M.A. Ellis).

For further information concerning small fruit diseases, contact Mohammad Babadoost, Extension Specialist of Plant Pathology, Department of Crop Sciences, University of Illinois at Urbana-Champaign. (217/333-1523; email: babadoos@uiuc.edu).

About 21 to 40 days after infection, small, brownish-black telia develop on the underside of infected leaflets. The teliospore borne in these telia germinate to produce a basidium, which produces basidiospores. In blackberries these spores than infect buds on cane tips. They also may infect buds or shoots being formed at the crowns of healthy plants in the summer. The fungus becomes systemic in these young plants, growing into the crown of the base of the infected shoots, and into newly formed roots. Orange rust is favored by low temperatures and high humidity. Temperatures ranging from 43 to 72° favor penetration and development of the fungus, but higher temperatures decrease the percentage spore germination. At 77°F aeciospores germinate very slowly, and disease development is greatly reduced. Spore germination and plant penetration have not been observed at 86°F. Aeciospores require long periods of leaf wetness before they germinate, penetrate, and infect plants.

CONTROL

1. Plant **only** certified, disease-free planting stock from a reputable nursery.
2. Before setting out new plants, remove and burn **all wild** brambles and any cultivated plants that are rust infected, including the roots. If rusted plants cannot be destroyed, do **not** plant susceptible brambles.
3. When the disease first appears in early spring, dig up and burn infected plants **before** the pustules break open and discharge spores. Prune out and burn fruiting canes immediately after harvest.
4. Improve air circulation by thinning out healthy canes in the rows and keeping the planting free of weeds.
5. Follow the raspberry and blackberry spray schedule outlined in the “Midwest Commercial Small Fruit and Grape Spray Guide.” (website: <http://www.hort.purdue.edu/hort/ext/sfg/>).
6. Plant resistant cultivars, if available.

In a properly managed planting, including the control measures outlined above, the disease is usually not serious. For more information on orange rust of brambles, refer to the “Midwest Small Fruit Pest Management Handbook” (<http://www.ag.ohio-state.edu/~ohioline/b861/index.html>) and “Compendium of Raspberry and Blackberry Diseases and Insects,” published by the American Phytopathological Society, St. Paul, Minnesota.

Publications mentioned above are available from University of Illinois, Ag Services, P345, 1917 S. Wright St., Champaign, IL 61820 (1-800-345-6087).