

Orange Rust of Brambles

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Orange rust is the most important of several rust diseases that attack brambles. All varieties of black and purple raspberries, and most varieties of erect blackberries and trailing blackberries are very susceptible. Orange rust *does not infect red raspberries*.

Unlike all other fungi that infect brambles, 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 is infected by orange rust, it is infected for life. Orange rust does not normally kill plants, but causes them to be so stunted and weakened that they produce little or no fruit.



Figure 1. Orange rust symptoms on the underside of a black raspberry leaf.

Symptoms

Orange rust-infected plants can be easily identified shortly after new growth appears in the spring. Newly formed shoots are weak and spindly. The new leaves on such canes are stunted or misshapen and pale green to yellowish. This is important to remember when one considers control, because infected plants can be easily identified and removed at this time. Within a few weeks, the lower surface of infected leaves are covered with blister-like pustules that are waxy at first but soon turn powdery and bright orange. This bright orange, rusty appearance is what gives the disease its name. Rusted leaves wither and drop in late spring or early summer. Later in the season, the tips or infected young canes appear to have outgrown the fungus and may appear normal. At this point, infected plants are often difficult to identify. In reality, the plants are systemically infected, and in the following years, infected canes will be bushy and spindly, and will bear little or no fruit.



Figure 2. Close-up of blister-like pustules on the lower surface of infected black raspberry leaf.



Figure 3. Black raspberry plant showing early season symptoms of orange rust. Note the “spindly” elongated shoots.



Figure 4. Early season symptoms on a black raspberry floricanne.

Causal Organism and Disease Development

Orange rust is caused by two fungi that are almost identical, except for a few differences in their life cycles. *Arthuriomyces peckianus* occurs primarily in the north-eastern quarter of the United States and is the causal agent

for the disease in Ohio. *Gymnoconia nitens* is a microcyclic (lacks certain spores) stage of *A. peckianus*. *G. nitens* is the more common orange rust pathogen on erect and trailing blackberries in the Southeast.

In late May to early June, the wind and perhaps rain-splash spreads the bright orange aeciospores from the pustules on infected leaves to healthy susceptible leaves where they infect only localized areas of individual mature leaves. When environmental conditions favorable for infection occur, the spores germinate and penetrate the leaf. About 21-40 days after infection, small, brownish black telia develop on the underside of infected leaflets. The teliospores borne in these telia germinate to produce a basidium, which in turn produces basidiospores. These basidiospores then infect buds on cane tips as they root. They also may infect buds or new shoots being formed at the crowns of healthy plants in the summer.

The fungus becomes systemic in these young plants, growing into the crown at the base of the infected shoot, and into newly formed roots. As a result, a few canes from the crown will show rust the following year. The fungus overwinters as systemic, perennial mycelium within the host. Orange rust is favored by low temperatures and high humidity. Temperatures ranging from 43 to 72 degrees F favor penetration and development of the fungus, but higher temperatures decrease the percentage of spore germination. At 77 degrees F, aeciospores germinate very slowly, and disease development is greatly retarded. Spore germination and plant penetration have not been observed at 86 degrees F. Aeciospores require long periods of leaf wetness before they germinate, penetrate, and infect plants.

Control

1. Whenever possible, start with disease-free, certified nursery stock.
2. When diseased plants first appear in early spring, dig them out (including roots) and destroy them before pustules form, break open, and discharge the orange masses of spores. If plants are not removed, these spores will spread the disease to healthy plants.
3. Remove all wild brambles from within and around the planting site. Wild brambles serve as a reservoir for the disease.
4. Maintain good air circulation in the planting by pruning out and destroying old fruited canes immediately after harvest, thinning out healthy canes within the row, and keeping the planting free of weeds.

5. Fungicide sprays are generally not considered an effective control method for orange rust in home fruit plantings. Commercial growers are referred to Bulletin 506-B2, *Midwest Commercial Small Fruit and Grape Spray Guide* for the most current fungicide recom-

mendations. This publication can be obtained through your county Extension educator or the Extension Publications Office, The Ohio State University, 216 Kottman Hall, 2021 Coffey Road, Columbus, Ohio 43210-1044.

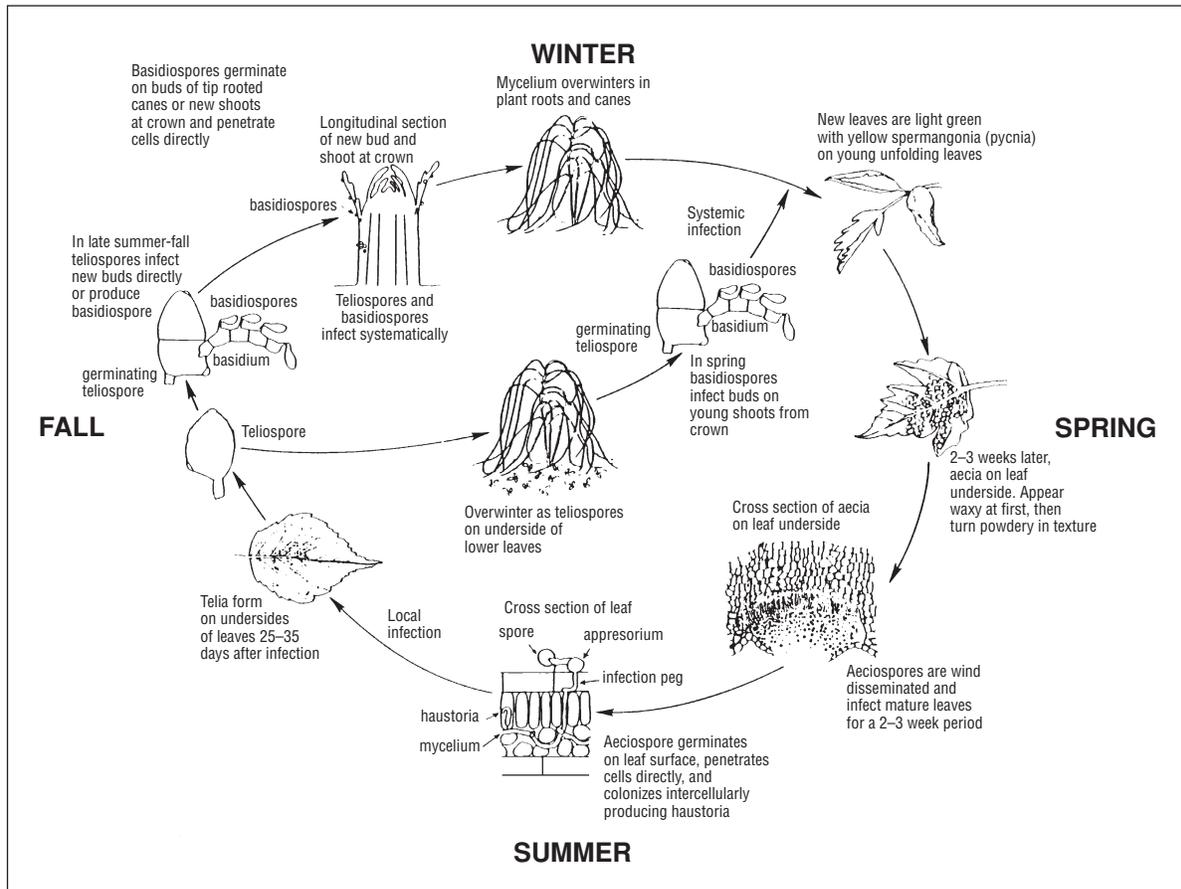


Figure 5. Disease cycle of orange rust. We wish to thank the American Phytopathological Society for the use of this figure. Taken from the APS Compendium of Raspberry and Blackberry Diseases and Insects.

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