

Orange Rust of Brambles

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Introduction:

Orange rust is a notable fungal disease impacting bramble species, particularly blackberries and certain raspberry cultivars. The disease, caused by fungi in the genus *Arthuriomyces* and *Gymnoconia*, is notorious for its ability to cause systemic infections that can severely diminish vegetative growth of affected plants and fruit production, leading to substantial economic losses. Therefore, a comprehensive understanding of the disease's symptoms, life cycle, and management strategies is critical for growers seeking to sustain healthy and productive bramble crops.



Figure 1. Leaf symptoms of Orange Rust. Photo credit: MU Plant Diagnostic Clinic

Symptoms:

The first symptoms of orange rust appear in early spring when new shoots and leaves emerge. Infected plants exhibit pale, yellowish-green leaves that may appear stunted or deformed. Black specks surrounded by chlorotic tissue will be present on the underside of the leaves. As the disease progresses, the characteristic orange, waxy pustules develop from the black specks (Figure 1). These pustules release bright orange, powdery spore masses that are easily spread by wind (Figure 2). Infected plants typically exhibit weak growth and produce fewer or no fruit as the disease systemically affects the entire plant.



Figure 2. Orange Rust observed under dissecting microscope. Photo credit: MU Plant Diagnostic Clinic

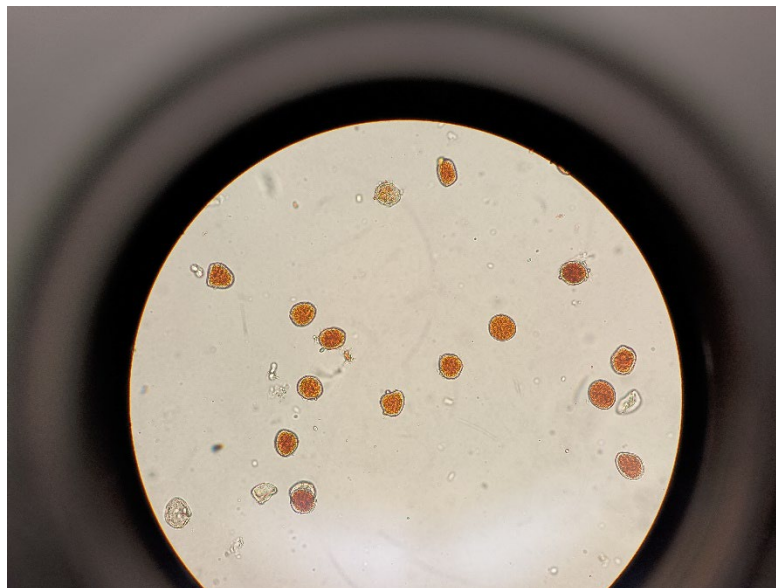


Figure 3. Orange Rust spores (Conidia) observed under compound microscope. Photo Credit: MU Plant Diagnostic Clinic

Causal Organism:

Orange rust is caused by two closely related fungi: *Arthuriomyces peckianus* and *Gymnoconia nitens*. Specifically, *Arthuriomyces peckianus* is often associated with blackberries, while *Gymnoconia nitens* typically affects raspberries. Blackberries are more susceptible to *Gymnoconia nitens* while Black raspberries are more susceptible to

Arthuriomyces peckianus. Red raspberries are resistant to Orange rust. The fungi persist in the plant year after year, spreading the disease throughout the entire plant over time.

Disease Life Cycle:

The orange rust fungi have a complex life cycle that involves multiple spore types and stages. The disease begins in early spring when overwintering spores (teliospores) on infected plant tissue germinate and produce basidia that further produce basidiospores which infect new leaves, leading to the development of the orange pustules producing aeciospores. As the season progresses, the fungus continues to spread within the plant, establishing a systemic infection. Infected plants remain a source of spores year after year, continuing the cycle unless they are removed.

Management Practices:

Effective management of orange rust involves a combination of cultural practices and, if necessary, chemical treatments. Early detection is crucial, so regular monitoring of bramble plants in early spring is recommended. Infected plants should be removed and destroyed immediately to prevent the spread of the disease. Selecting disease-resistant cultivars is also a vital preventive measure. In areas where orange rust is a known problem, fungicide applications may be warranted, particularly in the early spring when new growth is emerging. Maintaining good air circulation and avoiding overhead watering can also reduce the likelihood of infection.

References:

1. **Raspberries: Orange Rust.** Cornell College of Agriculture and Life Sciences.
<https://blogs.cornell.edu/berrytool/raspberries/raspberries-orange-rust/>
2. **Orange Rust on Raspberry.** University of Minnesota Extension.
<https://extension.umn.edu/plant-diseases/orange-rust-raspberry>
3. **Key Rust Diseases in Brambles.** Nourse Farms.
<https://noursefarms.com/news/post/key-rust-diseases-in-brambles>
4. **Orange Rust of Brambles.** Ohio State University Extension.
<https://ohioline.osu.edu/factsheet/plpath-fru-30>