RESEARCH LABORATORY TECHNICAL REPORT

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Gymnosporangium Rusts

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Rust diseases on woody ornamental plants are caused by several fungal genera with *Gymnosporangium* being one of the most common. These fungi require two alternating hosts to complete their life cycle. They infect conifers, mainly *Juniperus* species such as eastern red cedar, and woody plants in the Rosaceae family such as apple, quince, mountain ash, crabapple, pear, hawthorn, serviceberry, and rowan. On rosaceous hosts, Gymnosporangium rusts are characterized by leaf spots, defoliation, twig galls and fruit blight. Conifer hosts generally exhibit less severe damage.

Description and Life Cycle

About 40 species of Gymnosporangium rusts are described in North America. While rust pathogens cause highly conspicuous symptoms, they generally do not kill their host. More than half of the plants in the Rosaceae family are highly susceptible to rust fungi.

Most rust pathogens have a two-year disease cycle where infection transfers between different host plants. Following infection of the coniferous host, the fungus overwinters until the onset of spring. Galls start to form in the spring and approximately 20 months after initial infection, spore-bearing structures (telia) mature on the galls (Figure 1).

Rain and wind disperse the infectious material produced on the overwintering host to nearby rosaceous hosts. Dispersal may occur for several miles under high humidity conditions. Infection of the rosaceous host results in the formation of cylindrical, spore-bearing tubes (aecia), which will lead to infection of a coniferous host (Figure 2). Gymnosporangium rust fungi are widespread in areas where both types of hosts grow in close proximity.

Figure 1: Conifer twigs with reddish-orange telia (top) and telial horns (bottom) resembling tentacles projecting from telia

Symptoms

Development of the fungus on both hosts results in the swelling of leaf midveins, petioles, and/or twigs. Affected twigs may exhibit significant distortion and dieback. Conifers often exhibit colorful twig galls and altered growth (witches-brooms) in addition to dieback. Rosaceous hosts first exhibit orange-yellow leaf and fruit spots that swell over time and result in distortion of the affected tissue.

Figure 2: Foliage from apple/crabapple with leaf spots (top) and hawthorn fruit with tubular structures (bottom) projecting from aecia

Management

Prune out the symptomatic twigs/branches to reduce the amount of fungal inoculum present. Rake up and remove fallen foliage from beneath the infected plants each year. Direct overhead irrigation away from foliage and prune to improve airflow and faster foliage drying.

Therapeutic treatments are available and effective. Treatments on rosaceous hosts should be made at budbreak to protect new foliage. Preventive treatments of the coniferous hosts are generally not warranted.

Maintain optimal nutrient, pH, and organic matter levels based on soil analysis. Potassium phosphite may enhance plant defenses against infection. Please contact your Bartlett Arborist Representative to learn more about management strategies.

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