RESEARCH LABORATORY TECHNICAL REPORT

BARTLETT TREE EXPERTS
SCIENTIFIC TREE CARE SINCE 1907

Hemlock Rust Mite

By The Bartlett Lab Staff
Directed by Kelby Fite, PhD

Hemlock rust mite, *Nalepella tsugifoliae,* is an Eriophyid mite that feeds on hemlock needles causing foliar symptoms that are often mistaken for a nutrient deficiency, air pollution damage or winter injury. Eriopyhid mites are smaller than most spider mites, wedge-shaped, slow moving arthropods that are not as easily seen with the naked eye. Eriophyid mites are widely distributed and attack a range of plant species, most notably the conifers.

Biology

Hemlock rust mite is a cool season pest that is active in late winter-early spring and also in the fall. Nymphs emerge from overwintering eggs and immediately move to healthy tissue to feed. They feed by probing their stylets, needle-like sucking mouthparts, into the hemlock needles, draining the plant cells of their contents including chlorophyll (Figure 1). Maturing nymphs leave behind shed skins (exoskeletons) when they molt from one instar to the next as they migrate to feed on either upper or lower leaf surfaces (Figure 2). When weather conditions are ideal (i.e., warm fall followed by a long dry spring), multiple generations are produced over a short period of time leading to a population explosion. By mid-summer when damage is most evident, the mite population drops significantly due to warmer temperatures. This pest will survive the summer as eggs. As temperatures drop in the fall, their numbers increase again, completing the cycle.

Symptoms

Hemlock rust mite causes chlorotic to tan flecks on the upper and lower leaf surface due to the chlorophyll removed during feeding. Damage is similar to that caused by the spruce spider mite feeding but the flecks, are much smaller. When mite populations are high,

Figure 1: Discoloration on hemlock from feeding

Figure 2: Adults and shed skins of nymphs

the foliage may take on a dusty, rust-colored appearance. Defoliation of severely affected needles or premature needle drop in the fall may occur.

Management

Plants should be monitored carefully for outbreaks beginning in the late summer and early fall, continuing through warm periods in winter and early spring. A 10x hand lens is needed to identify these mites in the field. Look closely at the base of the needle where mites tend to congregate in early stages of an outbreak. Cultural practices such as appropriate mulching and irrigation during dry periods will aid recovery. Many options are available to manage this pest, but treatments should be timed appropriately in order to be effective. Please contact your Bartlett Arborist Representative for effective control treatment options.

Founded in 1926, The Bartlett Tree Research Laboratories is the research wing of Bartlett Tree Experts. Scientists here develop guidelines for all of the Company's services. The Lab also houses a state-of-the-art plant diagnostic clinic and provides vital technical support to Bartlett arborists and field staff for the benefit of our clients.