

Pine disorder: Dothistroma needle blight

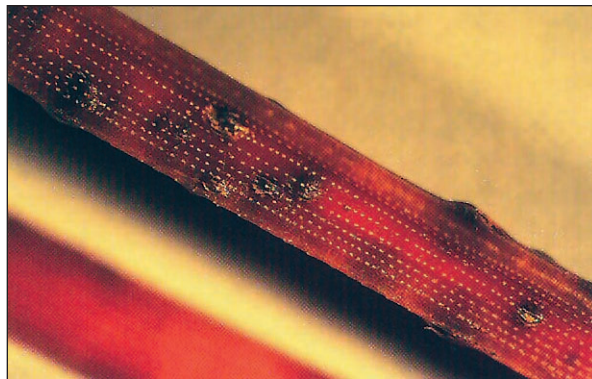
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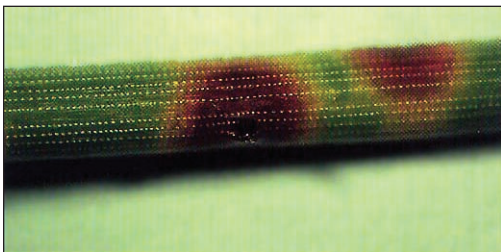
Frequently, the tip of an infected needle will die while the base remains green.

Dothistroma needle blight causes needle spots, discoloration, and substantial needle loss in heavily infected areas. First reported in Illinois in 1941, the disease is now common and serious in neighboring states to the west. This disease has been observed on individual trees throughout the state. It has limited the usefulness of susceptible pines for windbreaks, Christmas trees, ornamental purposes, and even timber production in some parts of the world. The disease has not been as serious in Wisconsin, but arborists and nursery growers should be familiar with the disease and its control.

Austrian pines are particularly susceptible, though the disease also attacks Mugo, Ponderosa, and perhaps other species of pine.



The raised black spots produce spores that will spread to infect new needles.



Yellow to brown spots mark the point of infection.

Symptoms and effects

Infection most commonly affects one, two or three-year-old needles, although current season needles may also show symptoms. Newly developed needles are resistant at first, but become susceptible about mid-June and remain susceptible thereafter.

The first symptom is scattered spots, varying in color from yellow to red. These appear in midsummer or fall, and later may turn brown. They often develop into red bands that encircle the affected needles. For this reason, the disease is also called the "red band disease." The tip of the needle beyond the spot then turns brown and dies, while the base remains green for a while. The dead portion is not always separated from the healthy portion by a band.

During late fall or winter, the surface of the spots frequently breaks open, exposing black spore-bearing structures of the disease-causing fungus. Older inner needles may become badly infected and drop, leaving only the tuft of new needles at the branch tips. Needle loss usually starts from the base of the tree, but may follow up the entire length of the tree if infection is severe. Infected needles commonly fall off during late spring or early summer, although they may drop at any time. The needle loss destroys the dense, dark green foliage that typifies these ornamentals. Continuously defoliated trees may die.

The spots on the needles and heavy loss of older needles are good diagnostic symptoms for field identification. Two other conditions cause symptoms that may be mistaken for dothistroma needle blight: air pollution, which causes sudden discoloration of current season needles in midsummer, and seasonal needle drop, the natural aging and loss of older needles characterized by yellowing of inner foliage in the fall of the year (see Extension publication *Evergreen Condition: Seasonal Needle Drop* (A2614)). If you need a laboratory examination to confirm field observations, collect twigs showing the range of symptoms and ages of needles and take them, along with appropriate information, to the county Extension office for diagnosis.

Cause

The fungus *Dothistroma pini* is responsible for dothistroma needle blight. Fungal spores develop on the black fruiting structures on the needles. The spores are released during periods of wet weather and spread by splashing rain. Splashing rain disperses the spores for short distances only.

Infection is much more likely to be severe and damaging during wet summers than during dry years.

Control

Cultural

Use disease-free planting stock to minimize spread of the disease. Individual trees vary considerably in susceptibility. Resistant selections are becoming available.

When isolated cases of the disease are found, raking and removing fallen infected needles may help control the disease. Typically, however, this practice is impractical and relatively ineffective.

Chemical

If infection is detected in valuable ornamental, Christmas trees or nursery stock, chemical treatments should be considered.

Some copper-containing fungicides registered for control of the disease, such as Bordeaux, are effective. Bordeaux may be purchased already prepared from many garden centers. Use at labeled rates. Most other chemicals are ineffective.

Freshly prepared Bordeaux is considered the most effective chemical to use. To prepare a Bordeaux 8-8-100 mixture, dissolve 8 pounds of copper sulfate (blue vitriol) in 50 gallons of water, and dissolve 8 pounds of slacked lime (spray lime) in another 50 gallons of water. Then pour the two together under continuous agitation, strain the solution to remove insoluble particles, and use it

the same day. To prepare 3 gallons of the solution (enough for the average 10-foot ornamental tree) dissolve 2 ounces of copper sulfate in 1 gallon of water and 2 ounces of spray lime in another 2 gallons of water. Then pour them together, stir, strain, and use.

One application each season usually provides adequate control. Treat in early June when new needles become susceptible. For more complete control, make two applications: the first when needles are just emerging, and the second 3–4 weeks later. The first spray protects the previous years' needles; the second spray protects current season growth. You must fully cover all foliage because missed needles may become infected.

These fungicides prevent infection, but do not cure it. Diseased needles will continue to deteriorate, so it may take two or more years of successive treatments to return the tree to good health.

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