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EC65-1840 Plant Diseases : Dosthistroma Needle Blight of Pines

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PLANT DISEASES

Dothistroma Needle Blight of Pines

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Extension Plant Pathologist

For several years many pines in windbreaks and ornamental plantings in Nebraska and adjacent states have been losing their needles prematurely. Several fungi may cause early needle drop (casting) in pines. However, diagnosis of pine samples submitted to the University of Nebraska shows that most samples have been infected with only one fungus.

SYMPTOMS

On Austrian and ponderosa pines, the first symptom is yellow to tan spots that appear on infected 1, 2, or 3-year-old needles during the fall. These spots turn brown or reddish-brown (Fig. 1). They are generally circular or slightly oblong and may develop into a band around the needle (Fig. 2). The fungus develops within the tissues, killing the end portion of the needle while the base of the needle remains green (Fig. 3).

Fig. 1. The first symptom—yellow to tan spots.

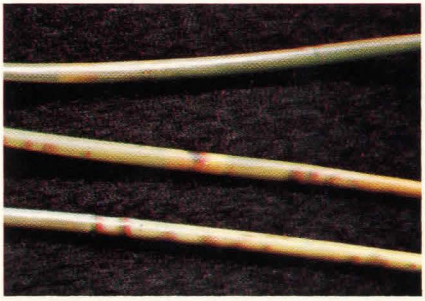

Fig. 2. Yellow to tan spots may develop into a band around needle.

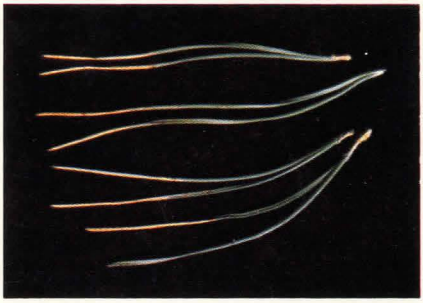

Fig. 3. End portion of needle dies, base remains green.

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Typically, clusters of needles within a shoot are uniformly infected. Infection is usually more severe among the lower branches (Fig. 4).

As the disease progresses, the base of the needles die and the needles drop. Infected needles may be dropped during the winter, but the greatest loss usually comes during late spring or early summer. Continued infection over a number of years can kill the tree.

Fig. 4. Infection usually is more severe among lower branches.

CAUSAL FUNGUS

The fungus that causes Dothistroma needle blight is called *Dothistroma pini.* After infection the fungus develops in the small spots or bands on the needles and produces spores in the spring and summer.

When there is enough moisture the spores spread to uninfected needles, germinate, and cause new infection. The new infection can occur on both the previous season's and current season's needles.

HOSTS

In Nebraska Austrian Pine *(Pinus nigra),* ponderosa pine *(P. ponderosa*), and Mugho pine (*P. mugo*) are attacked by this fungus.

CONTROL

Standard strength Bordeaux mixture has been shown to give excellent control when applied during the growing season.[1] Currently the following spray schedule is recommended:

Apply the first application of Bordeaux mixture (8-8-100) in mid-May. Apply a second application about 3 weeks later, with a third spray 2 to 3 weeks after the second.

Bordeaux mixture acts as a protective coating for the needles. When the spores of the fungus come in contact with this fungicide they are killed. The first spray protects the previous season's needles and the second and third sprays are necessary for protection of newly developing needles.

HOW TO PREPARE BORDEAUX MIXTURE

Bordeaux mixture is made in different strengths by mixing solutions of copper sulfate (also known as bluestone or blue vitriol) with suspensions of hydrated lime in water. Standard Bordeaux mixture, a 8-8-100 formulation, consists of 8 pounds of copper sulfate and 8 pounds of lime per 100 gallons of water.

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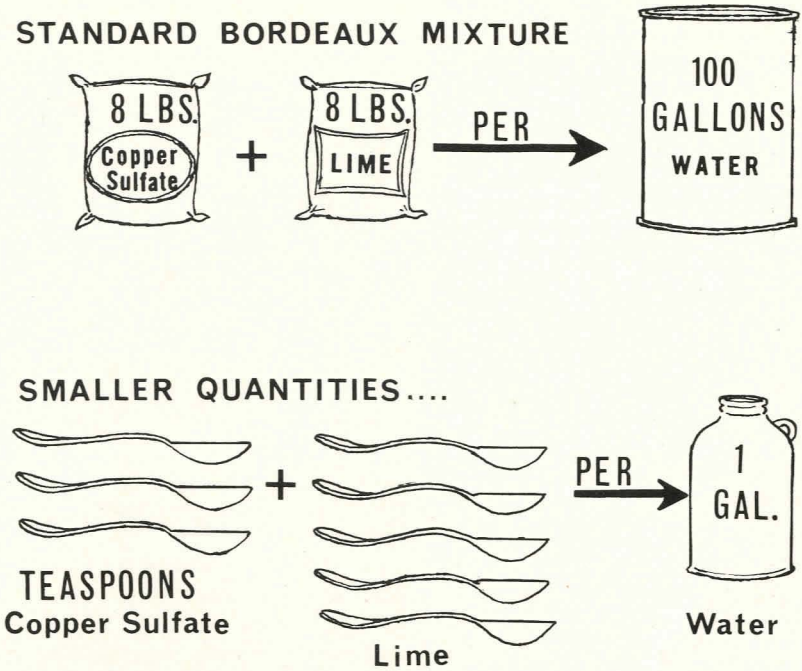
[1] Based on research conducted by Dr. Glenn W. Peterson, Plant Pathologist, U.S. Forest Service, Rocky Mountain Forest and Range Experiment Station cooperating with the University of Nebraska.



Smaller quantities can be made by dissolving 3 teaspoonfuls of copper sulfate and 5 teaspoonfuls of hydrated lime into 1 gallon of water. Any desired amount of spray material can be prepared by proportioning the 3 components either by weight or volume.

Copper sulfate is sold as crystals or as a fine powder. It dissolves readily in powder form but rather slowly in crystalline form. Crystals can be dissolved in a few hours, however, by suspending them in a loose-meshed bag or cloth sack so that the bottom of the sack merely touches the surface of the water. If the water is warmed, the copper sulfate crystals will go into solution much more quickly.

To make homemade Bordeaux mixture:

1. Dissolve the copper sulfate in water in a wooden, earthen, or glass container (do not use a metal container).

2. Dissolve the hydrated lime in another container of water and strain the mixture through cheesecloth.

3. While the solution is being agitated, slowly and simultaneously strain the copper sulfate solution and the lime-water mixture into enough water to make desired amount of spray.

Homemade Bordeaux is usually more effective than prepared Bordeaux. However, it is considerably more convenient to make the spray material from the powdered, ready-to-mix form.

Bordeaux spray deteriorates rapidly and should be used within 2 or 3 hours after it is prepared.

CAREER OPPORTUNITIES

In the College of Agriculture and Home Economics young men and women can prepare for one or more of many opportunities which make up the broad field of agriculture.

For the scientifically interested there are research opportunities with all types of livestock and livestock products, with all agricultural crops including trees and grasses, and with engineering applied to agricultural problems.

For those who want to farm or ranch for themselves in all the variety of specialized and general enterprises, the college provides the basic knowledge that can mean greater success.

For the business-minded there is a range of oportunities from agricultural salesmen, to banks, to economics research specialists.

For those interested in service to agriculture there is high school teaching, Peace Corps and other foreign assignments and other service opportunities.

For women there are many opportunities in family economics, food and nutrition, education, textiles, clothing and design.