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You ... can save your Pines from ... Dwarf Mistletoe

#35
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Dwarf mistletoe is a widespread enemy of western pines. It slowly weakens the trees and eventually kills them.



This U.S. Forest Service booklet will help you protect your trees from this disease. The first part explains what the disease is, how it spreads, how it kills and how to tell if your tree is infected. It then suggests control procedures that you can take to keep your trees alive for many years.

The dwarf mistletoes are related to the common Christmas mistletoes, but are smaller, leafless, and grow on branches and trunks of cone-bearing trees. Two kinds damage pine in the central Rocky Mountains.

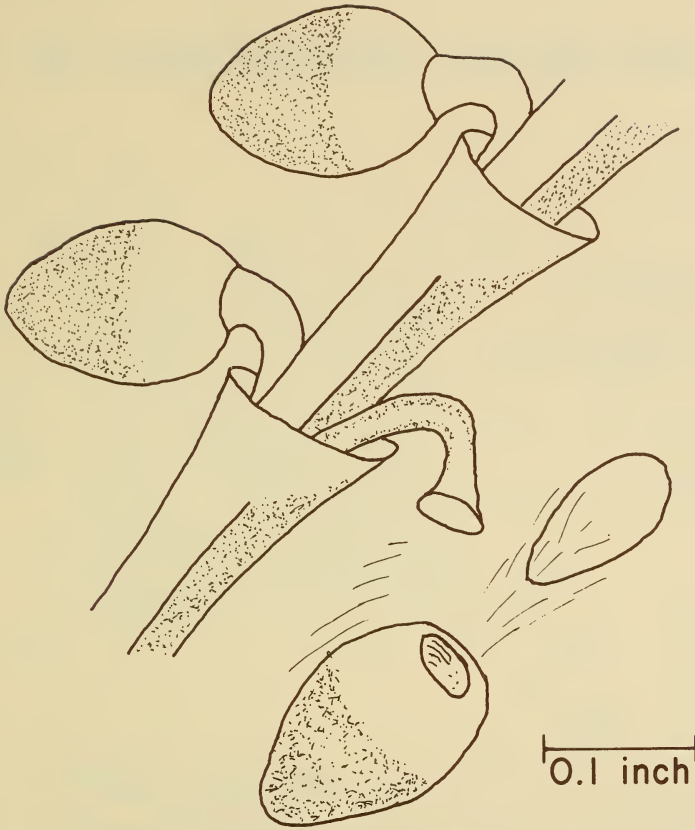
Ponderosa pine mistletoe is orange with thick shoots from 3 to 6 inches long. Lodgepole pine mistletoe is green or yellow, with slender shoots about 2 to 4 inches long.

Different dwarf mistletoes attack other cone-bearing trees throughout the West. Their life histories are similar, so the control recommendations given in this pamphlet apply to all of them.

The Life Cycle

Dwarf mistletoe plants are either male or female. Although both types damage pines, only the female plants produce seeds that spread the disease.

Mistletoe seeds are produced in a berry. Pressure builds up within the berries as they ripen. Finally in August or September the pressure is so great that the berries are broken away from their stems and the seeds are shot out. They take off at 60 miles per hour and travel for distances up to 20 or 30 feet. A gluey coating on the seeds enables them to stick wherever they land.



The dwarf mistletoes are native parasites that have long been established in North America.

Mistletoe in your trees originally came from seeds produced in nearby infected trees, some of which may now be dead.

Mistletoe Completes Its Life

Seeds land on
the pine needles.
August or
September



Fruits mature after
2 more years and
the life cycle
starts again.



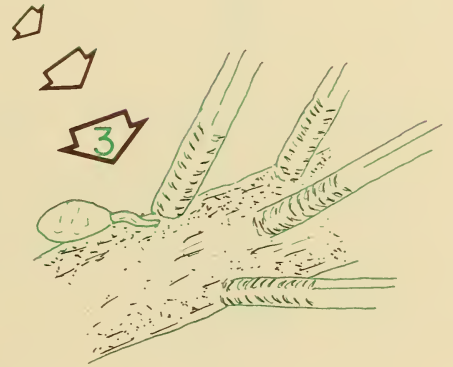
Shoots first
appear 2 years
later.

Cycle in a Minimum of 6 Years



Rains wash them onto the twig.

They germinate and infect the twig.



A swelling appears in about 2 years.

How



The mistletoes weaken pines by slowly robbing them of both water and food.



Infected trees start declining in their tops as more and more food is taken by the infected branches below.

Mistletoe



The tree slowly dies from the top. Eventually, there are not enough live branches....

Kills



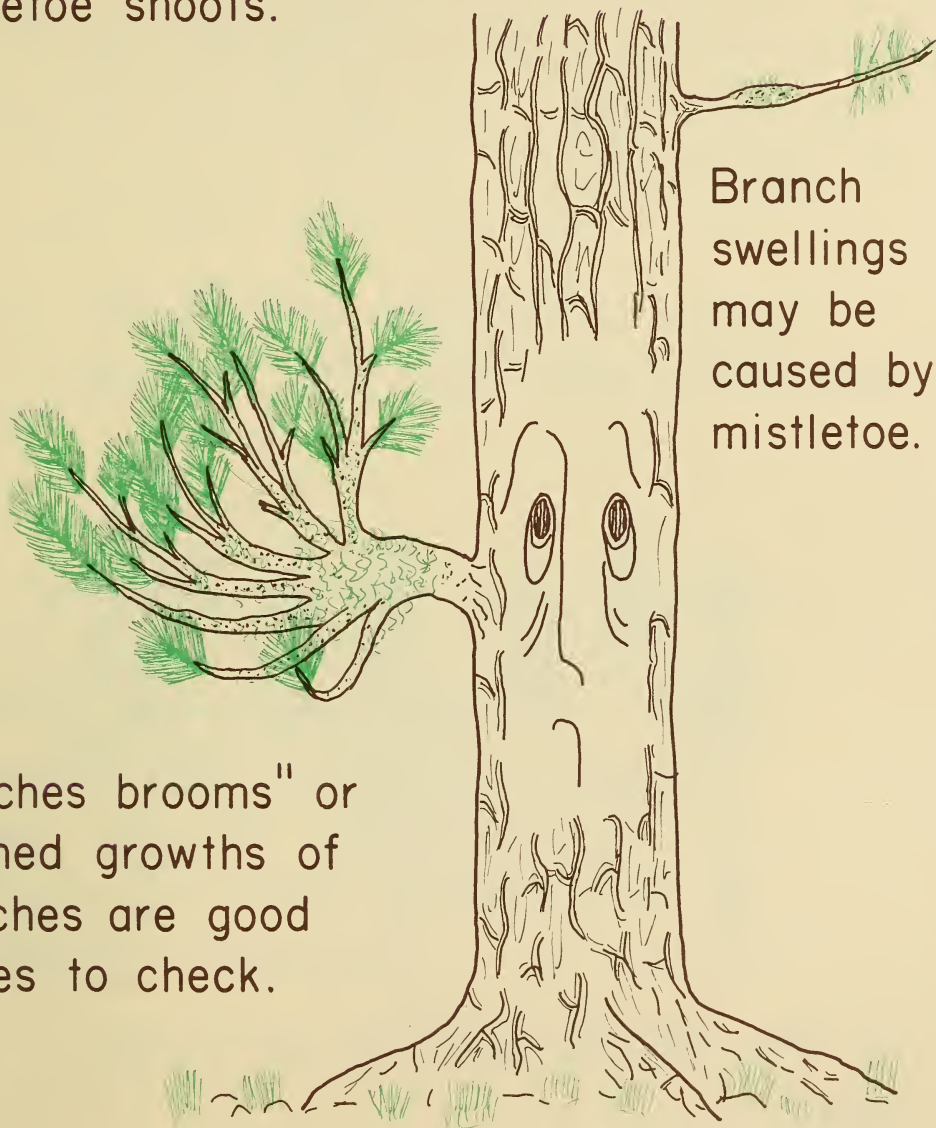
....and the entire tree dies.



The length of time it takes for mistletoe to kill a tree depends on several factors—how many mistletoe plants there are in the tree, how vigorous the tree is, and how old the tree was when it first became infected. Damage develops slowly until the trees are heavily diseased, then death soon follows.

Is Your Tree Infected?

The easiest way to tell if your tree is infected is to look for mistletoe shoots.



"Witches brooms" or bunched growths of branches are good places to check.

Branch swellings may be caused by mistletoe.

Control of Dwarf Mistletoe

The goal need not be complete eradication of the mistletoe. This could require cutting all your trees.



Instead, if mistletoe is reduced sufficiently your trees can continue



to live and be pleasing for many years.

Cut heavily infected trees first

Trees that are severely infected with mistletoe in the upper branches or those with only a few live branches should be cut. Such trees are hazardous because dead branches or tops may break and fall. Also, high, unreachable infections will continue to shower seeds on nearby trees.

Mistletoe control work should be done in the summer. Mistletoe shoots are more easily seen then because the berries are ripening. Seed dispersal starts about mid-August so control work should be completed by then.

Most trees can be pruned

Pruning (cutting off) infected branches reduces the amount of mistletoe and can also improve the health of the tree. Even trees that have deteriorated to the point where the tops are thin and off-color can be saved by pruning, if there are enough healthy branches remaining.



As shown, all branches to be pruned should be cut off flush with the trunk. Cut off the entire branch; don't attempt to prune out individual mistletoe plants, because there will usually be small mistletoe plants that are overlooked, and these will grow out later.

Cut off all live branches up to and including the highest infected branch.

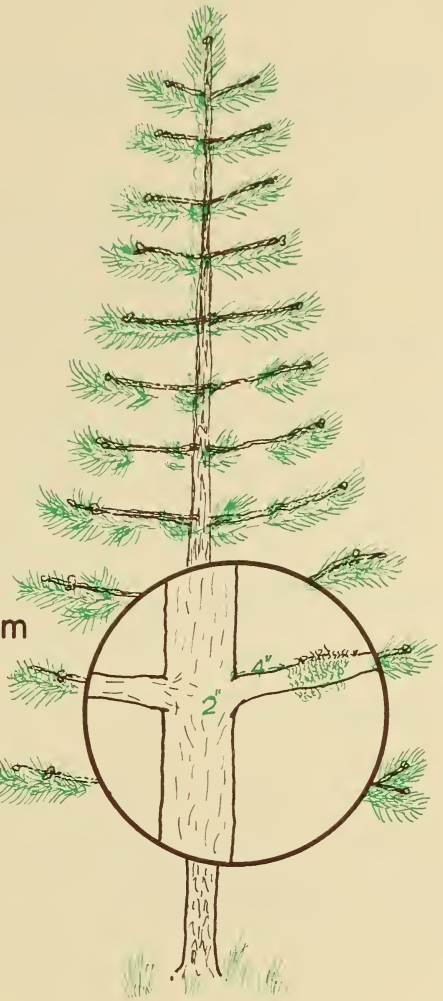
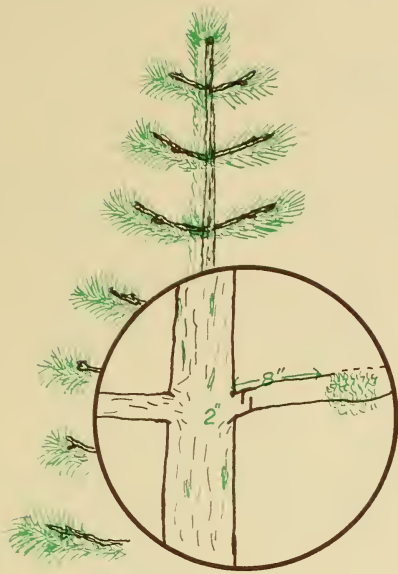
Do not leave isolated branches even though they may appear to be mistletoe free; they probably are not (look again at the life cycle on pages 6 and 7).

If there are plenty of live branches above the highest infected branch, cut off branches for 2 feet or so above this point.

This will help eliminate many young infections that would show up later.

Mistletoe root systems extend for several inches beyond the mistletoe shoots inside the pine branches. Thus, if an infection on a branch is very close to the trunk, the infection may have already entered the trunk and shoots will form on the trunk even if the branch is pruned. Therefore, if shoots are closer to the trunk than the minimum distance shown in the table, the entire tree should be cut.

Note: This is not a hard and fast rule. If you have a particularly desirable tree that cannot be pruned according to the above recommendations, you can prune the infected branches. However, every year or two you must plan to knock off the mistletoe shoots on the trunk as they appear.



Note: Make cut from bottom first, then complete cut from above.



Branch diameter at trunk	Minimum distance from trunk to shoots
Under 1	6
1 to 2	8
2 to 3	10
3 to 4	12

----- inches -----

Followup treatment

There will always be very small mistletoe plants and some that have not yet produced shoots which you will miss on your first pruning job. This means that you should examine your trees every 2 or 3 years and prune any infected branches and brush off trunk shoots. This follow-up is very important; if it cannot be done, the initial pruning should not be attempted.

Dwarf mistletoe shoots die as soon as the branches are cut so it is not necessary to burn or discard them. Because of possible insect buildup, it is not advisable to stack cut stems or branches against living trees.

Other control measures

Research is currently being conducted on chemical control for dwarf mistletoes; but at present, there is no chemical that has proved effective and practical.

If the disease is so advanced that most of the trees should be cut, planting nonsusceptible trees may be an alternative. These mistletoes will not attack hardwood trees (aspen, ash, elms, poplar, birch, etc.) so any of these will be safe for planting.

If you live in the central Rocky Mountains you can substitute the following species:

In ponderosa pine areas

Douglas-fir

White fir

Blue spruce

Pinyon

Limber pine

Rocky Mountain juniper

In lodgepole pine areas

Engelmann spruce

Subalpine fir

Douglas-fir

Studies are being conducted to discover additional trees that might be added to these lists.

For other parts of the West, consult your State Forester for advice on nonsusceptible trees that you can plant.

For further information on dwarf mistletoe control, specialists in the Office of the State Forester can help you:

Colorado - Colorado State
University, Fort Collins
Montana - 2705 Spurgin Road,
Missoula
State Capitol
Phoenix, Arizona
Sacramento, California
Boise, Idaho
Carson City, Nevada
Santa Fe, New Mexico
Salem, Oregon
Salt Lake City, Utah
Olympia, Washington
Cheyenne, Wyoming

U. S. Department of Agriculture
Forest Service

Rocky Mountain Forest and
Range Experiment Station★
Raymond Price, Director

Rocky Mountain Region
David S. Nordwall,
Regional Forester

Hawksworth is with the Rocky Mountain Station,
Fort Collins, Colorado;
Stewart and Bailey are with the
Branch of Pest Control, Forest Service,
Denver, Colorado.

★ With central headquarters at Fort Collins, in cooperation
with Colorado State University.