

mycoplasma should be preferred for planting. Once a virus-or mycoplasma-free tree has been planted it can still become infected with one or more viruses and mycoplasmas during its long life span. A growing tree can sometimes be protected from being infected with a virus or mycoplasma when the methods of spread of these pathogens are known and means of checking their spread are available. Insect-transmitted viruses and mycoplasmas, for example, could conceivably be controlled by controlling with insecticides the insects that spread them. For a number of reasons, however, this method of control of tree viruses and mycoplasmas is seldom satisfactory, since a few insects almost always manage to feed on a sprayed tree long enough to transmit the pathogen before the insects are killed by the insecticide. Control of the other vectors of tree viruses is just as difficult. With some virus and

with all mycoplasma diseases it is best to remove and destroy diseased trees as soon as symptoms are detected. It is also important to know what other trees, shrubs or other plants are infected by the same virus and mycoplasma and to remove them too, so that the insects and other vectors will not have a chance to carry it from them to new, healthy trees. Unfortunately, neither all the alternate hosts nor the methods of natural spread of shade and ornamental tree viruses and mycoplasmas are known, and much more information is needed in this area as well as in the area of chemical controls before effective control measures against tree viruses and mycoplasmas can be formulated.

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## ABSTRACT

Scharf, R.F. and F.G. Hawksworth. 1974. **Mistletoes on hardwoods in the United States.** USDA Forest Service, Forest Pest Leaflet 147. 7 p.

The traditional use of mistletoes during holiday seasons, their involvement in folklore and legend, their consumption by domestic and wild animals, and their use for medicinal purposes make mistletoes of widespread interest to the public. The fact that these plants are parasites that injure and eventually kill trees—both conifers and hardwoods—is not well known.

The mistletoes are green, flowering plants that require a living host. Some are rather specific and grow on only a single genus of tree; others occur on a wide range of hardwood species. Even though they are completely parasitic, they do manufacture much of their own food materials by photosynthesis and in general require only water and mineral elements from the host plant. In the absence of the green aerial portions of the mistletoe plant, however, the root system of the parasite can utilize host nutrients and remain alive within an infected branch for many years.

Infection takes place by means of a specialized, penetrating structure that forces its way through the bark and into the living host tissues. Once infection has occurred, the root system of the parasite grows within the branch. The aerial shoot system begins to develop shortly after the root system is well established. Often several years are required after infection for a new seed-bearing plant to develop.

The damage caused by mistletoes in most cases outweighs their economic values. Trees heavily infected by mistletoe are weakened, reduced in growth rate, and sometimes killed. Weakened trees are predisposed to attack by insects and often succumb during periods of drought or other adverse conditions.

Homeowners with only a few to several infected trees will not find control difficult. Infected limbs can be pruned off, if possible. If this is not practical for esthetic or other reasons, the mistletoe shoots can be broken off periodically. Planting resistant trees that are not susceptible to local species of mistletoes is a sound approach to control.