



Tree Conservation Notes

Athens-Clarke County Community Tree Program

Mistletoe

Introduction

Broadleaf mistletoe (*Phoradendron spp.*) is a common pest affecting trees in Athens-Clarke County and throughout the Southeastern United States. It is an evergreen, parasitic plant that grows on many species of landscape trees, but is especially common in our area on oaks and hickories (including pecans). It is most conspicuous in the winter when these trees have dropped their leaves.

Biology

Broadleaf mistletoe has thick, fleshy leaves and green stems. The entire plant develops a rounded form and grows to be as large as 2 feet in diameter. The plant survives by penetrating the bark of living trees and extending its "haustoria" (root-like structures) into the water-conducting tissues of the tree. The haustoria extend for long distances up and down within the branches or trunk of the tree. Swollen areas often form along the branches where older infections are present.

Mistletoe develops small, sticky, whitish berries on the female plant during October through December. The male plant produces pollen only. The berries of the mistletoe are very attractive to many types of birds. The birds eat and digest the berries and excrete the seeds, which stick tightly to the branches on which they land. A publication by the University of California Division of Agriculture and Natural Resources (Pest Notes, Publication 7437) states:

"The rapidity with which mistletoe spreads is directly related to the proximity and severity of established infestations, and newly planted trees can be quickly infested if they are growing near old, heavily infested trees."

In other words, the more mistletoe a tree has, the more it and the surrounding trees will be infected, since the birds eat the berries in the tree, and then deposit them in the same location or in nearby locations. Berries also fall down through the tree and the pest can be transmitted in this way.

By absorbing both water and nutrients from within the tree, tree vigor is diminished. Heavily infested trees can be stunted or killed, especially if further stressed by drought, insects, or other pest or environmental problems.

Control Options

There are several methods that have been used to attempt to control the spread of mistletoe. For trees with only a minor amount of infection, the most effective control is to prune out the infected branches. This should be done as soon as the pest appears, and should be done by cutting the infected branch back to the parent branch.

Tree limb pruning is not feasible for trees that have a substantial number of infection points or for very old or high value trees, as the removal of a large percentage (greater than 25 - 33%) of the tree's branches may weaken or kill the tree. For these trees, removal of *only* the mistletoe where it attaches to the branch may be most effective. Removal before the mistletoe produces berries, and before the berries are eaten by birds, is important. The mistletoe plant will re-sprout, but the amount of infection will be controlled through the suppression of the seed source. The mistletoe will have to be removed on a regular basis to eliminate fruiting and the spread of the pest.

After the removal of the mistletoe at the branch, the branch can be wrapped with black plastic to exclude the light required by the mistletoe to resprout. In larger trees, and where multiple infection points exist, this would be both impractical and unsightly.

For trees that are severely infected, removal of the entire tree can be effective in eliminating the source of seed and spread of the pest to other trees in the area.

Chemical control with the plant growth regulator ethephon (Floreel Fruit Eliminator) has been used with only limited success. The chemical causes the exposed portion of the plant to die back and fall off, but control is only temporary, as the plants will re-sprout eventually (within 4 years). The chemical can be applied in the spring before leaf-out, when the tree is still dormant, and daytime temperatures are above 65 degrees F. However, this chemical can cause permanent stains (blue/purple) on sidewalks, buildings, and other infrastructure. It also exaggerates any stress that a plant may be experiencing.

Recommended Management Strategy

Any single control method for an individual tree must be integrated with a broad-based control program to reduce and if possible eliminate the source of seed within a geographical area. The removal of mistletoe infections as outlined below should be part of the routine operational pruning done each year by geographic area. The following control strategy is recommended:

1. For trees with new or minor infections, removal of the infected branches is recommended, at least 12 inches and preferably 24 inches inward from the point of attachment; and, removal of infected branches and/or mistletoe plants from other trees in the area are recommended. After removal, monitor the tree for additional infections and remove branches/mistletoe as necessary.

2. For trees with moderate infections, removal of the exposed portion of the mistletoe plant from the branch is recommended; and, removal of infected branches and/or the mistletoe plants from other trees in the area is recommended. After removal, monitor the tree for additional infections and remove branches/mistletoe as necessary.
3. For trees with extensive infections, removal of the entire tree is recommended, unless the tree is of high value, then removal of the mistletoe plants from the branches is recommended.
4. When and where possible plant resistant species and avoid planting susceptible species. Known resistant species include Bradford pear (some infection does occur on these trees), Chinese pistache, crapemyrtle, eucalyptus, ginkgo, goldenrain tree, sweetgum, sycamore, and most conifers. Known susceptible species include alder, 'Aristocrat' flowering pear, ash, birch, box elder, cottonwood, locust, silver maple, water oak, willow oak, walnut, and zelkova. The susceptibility of other species is unknown.
5. Where a substantial number of new trees are being planted, remove mistletoe from the surrounding trees to reduce the potential for infection of new trees.

The decision on which method of control to use should be based upon the extent of the infection, the age and health of the tree, the tree's geographic location, and the management goals for the area in which the trees are growing.

References

Ali, A. D. *Epiphytes and Parasites*, Arbor Age, November 2000.

Monterey Lawn and Garden, *Information, Growth Regulators*, Florel Brand Fruit Eliminator, www.montereylawngarden.com/info/forel.html.

Perry, E. J., and Elmore, C. L. *Mistletoe: Integrated Pest Management for Home Gardeners and Landscape Professionals*, Publication 7437, Pest Notes, University of California, Division of Agriculture and Natural Resources, August 2001.

Polomski, Bob and Ham, Don, *Getting Rid of Mistletoe*, Clemson University, Cooperative Extension Service, December 1999.

USDA Forest Service, *Mistletoe caused by Phoradendron spp.*, Forest Health Protection, Southern Region.

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