



Mistletoe: Not Just for Holiday Romance

At this time of year, mistletoe is a tradition above doors for some to obtain kisses. However, it is around in many landscape trees all year when not assisting in romantic endeavors.

American mistletoe (genus *Phoradendron*) is a persistent, evergreen, photosynthetic (contains chlorophyll), seed-producing plant that is parasitic on certain woody plants, primarily hardwood or broadleaf trees. It is particularly conspicuous on hardwoods after leaf fall.



The mistletoe derives water and mineral nutrients from the sap of its host plant. Because the leaves of the mistletoe plant contain chlorophyll (green color), the plant can produce its own food through photosynthesis using water and minerals derived from the tree that supports it.

The leaves are leathery and occur opposite each other on the mistletoe stem. The branching pattern of the mistletoe plant also is opposite. The plant requires direct sunlight for best development, which explains why it usually is found high in the crown of tall trees. Mistletoe may change from green to a greenish-yellow color during the winter months, but this is not an indication that the plant is unhealthy.

The best indication of mistletoe infection is the presence of dense clusters of vegetation in the crown of host trees. The evergreen mistletoe plant is most easily recognized in the winter months when deciduous trees have dropped their leaves. Trees vary in their susceptibility to mistletoe with water oak, sugarberry, and elm being the most commonly infected. Ash, beech, cherry, dogwood, sweet gum, hickory, maple, Osage-orange, persimmon, sassafras, walnut, sycamore, and willow also may be infected. It has been reported on 110 different species of trees in the eastern United States.

Mistletoe in this part of Texas is a dioecious evergreen parasitic plant, meaning the male and female flowers are on different plants, and the plant remains green all year long. Several species of this parasitic plant exist.

Phoradendron on Hardwoods

<i>Phoradendron</i>	Hosts	Distribution	Remarks
<i>P. serotinum</i> [= <i>P. leucarpum</i> , = <i>P. flavescens</i>]	More than 100 species of hardwoods	Southward from central Texas to S. Illinois and New Jersey	Often locally restricted to particular host species
<i>P. tomentosum</i> ssp. <i>tomentosum</i>	Hackberry (<i>Celtis</i>) and mesquite (<i>Prosopis</i>)	Texas and Oklahoma	Similar to <i>P. serotinum</i> . Leaves less than 28 mm long

The flowers are small and creamy-white in color. Only the female flowers produce seeds, which are white and embedded in a sticky, gelatinous pulp enabling the seeds to adhere to the bark of trees. The seeds are commonly distributed by sticking to the beaks and feet of birds or by bird droppings after passing through the bird's digestive system. Under favorable temperature and moisture conditions, the seeds germinate almost anywhere, but trees will only become infected when seeds germinate on the thin bark of small branches. Successful infection of a host tree occurs when the mistletoe seed germinates and a root-like structure (haustoria) penetrates the bark through a lenticel or bud. It is common for the tree branch to be enlarged where the mistletoe plant attaches to the branch.



The aerial portion of the plant develops very slowly the first year, growing less than one-half inch. Under ideal conditions, mistletoe may develop an aerial spread of three feet in six to eight years. The longevity of mistletoe plants seems to be limited only to the life of the host tree with some plants living for more than 100 years. On the average, the aerial portion of a single mistletoe plant survives less than eight years, being easily broken off by storms. Destruction of the aerial portion of the plant usually stimulates the development of dormant buds and multiplies the presence of the plant on its host.

Mistletoe has few natural enemies, and effective control is very difficult to achieve. Where feasible, the homeowner can take steps to minimize mistletoe problems in trees.

Methods of Mistletoe Control

Although control of *Phoradendron* in forest situations is very difficult, homeowners with a few infected trees do have some options.

Pruning. Removing entire trees that are severely infected is an option, albeit an undesirable one in many cases. Removing infected branches is effective, but may not be practical or esthetic because of the size of the tree, number of branches to be pruned, etc. The shoots (stems and leaves) of the mistletoe can also be removed which, if done before seeds are set, will help reduce the number of new infections originating from this seed source. Mistletoe shoots will regrow from the pruned infection area, so this method is only a temporary solution. It is also important to remember that this method does not prevent the introduction of seeds from other infected trees (your neighbor's!).

Covering Infected Areas. As well as removing the shoots, it has been suggested that the affected branch can be covered with an opaque material (tar paper, creosote, duct tape, black polyethylene, etc.). In theory, covering the aerial portion of the plant, or its point of attachment after it has been removed, with black plastic (or other suitable material) would block sunlight and the plant would eventually die. However, in practice, applying black plastic high in the top of a tree can be difficult and dangerous. In addition, plastic tends to deteriorate over time; and would be unsightly, especially in the winter months when trees are bare.

Resistant Trees. A very sound approach to control is to plant trees known to be resistant to the *Phoradendron* species that is causing problems in your local area. Of course this does not help when an existing infected tree is already present, but should be considered for new home landscaping. Some trees that appear to be resistant to mistletoe include crape myrtle, Chinese pistache, Bradford pear and red cedar.

Chemicals. Applying a herbicide to the mistletoe during the winter when the host tree has no leaves has met with limited success. However, because it is so easy to damage the host tree and other nearby plants, using a herbicide is not recommended. A plant growth regulator called ethephon is the only product registered in the USA for the control of mistletoe on deciduous trees. In California, ethephon (Monterey Florel brand) has been used to control mistletoe in *dormant* host trees. The important word here is *dormant*. If this chemical is used on trees with leaves present, one runs the risk of killing the tree. The chemical spray must thoroughly

wet the mistletoe foliage to be effective. Spraying provides only temporary control, because after the shoots fall off, the mistletoe will regrow from the infection sites. Remember that you should be very cautious when using chemicals of this type (read the labels, get advice from local extension agencies, etc.).

A Different Philosophy

It is important to assess the situation with your tree(s). Is the mistletoe actually killing the tree? In many cases, a tree may support a mistletoe population, but it does not seem to show major pathological effects. When you see a large, mature tree with a sizeable number of mistletoes growing on it, bear in mind that this tree has likely been infected for many decades and has not died. If the tree dies after living 100 years, can we place the blame on the mistletoe or is this within the range considered normal for the lifespan of that tree species? A plant biologist interested in parasitic plants, would look at a tree heavily infested with *Phoradendron*, and say "Wow, look at that wonderful population of *Phoradendron*!" When others look at it, they may say "Oh, that poor tree!" It's a mindset thing. There is not much one can do about a tree with all that mistletoe, so maybe we should appreciate the marvelous co-evolutionary relationship that is taking place.