



Missouri Environment & Garden

Mistletoe Through the Ages *by Michele Warmund*

Like poinsettia, holly, pine, and fir trees, mistletoe is also associated with the winter holiday season. Partially-parasitic plants in the genera *Viscum*, *Arceuthobium*, and *Phoradendron* are all called mistletoe. Host species infested with mistletoe often have abnormal growth and are susceptible to wood-boring insects, fungi, and other pathogens. Heavy infestations of mistletoe can also cause limb death on host trees.

Viscum album (European mistletoe) is native to Europe, often found growing in poplar, apple, and hawthorn trees. It was introduced into California by Luther Burbank in the early 1900's and is now found on 23 deciduous tree species, including apple, pear, poplar, silver maple, black locust, and red alder. European mistletoe plants have pale green leaves that turn yellow when dried. Leafy mistletoes, including *V. album* and *Phoradendron* species, are not found in cold regions since they are susceptible to sub-freezing temperatures.

There are about 42 species of *Arceuthobium*, known as dwarf mistletoes that infect conifers. In the western United States, dwarf mistletoes cause an estimated loss of 3.3 billion board feet of wood annually. These mistletoes have scale-like leaves and dioecious flowers (male and female flowers on separate plants).

American mistletoe (*Phoradendron leucarpum*), commonly sold during the holiday season, is generally harvested from trees growing in Oklahoma and Texas. American mistletoes are found in 16 counties in Missouri, mostly in the southeastern area of the state. Like European mistletoe, *P. leucarpum* is an evergreen shrub that parasitizes several types of deciduous trees growing in bottomland forests and along streams and rivers. Host trees for American mistletoe include river birch, blackgum, swamp tupelo, American elm, etc. However, sycamore (*Platanus occidentalis*) is the most common host for mistletoe in Missouri.



Mistletoe infesting a host tree

American mistletoe is visible as a dense mass of green vegetation called “witches’ brooms”, growing in deciduous trees after leaf fall. American mistletoe is considered hemiparasitic or semi-parasitic because it obtains water and mineral nutrients from the host tree, but it also derives nutrition from photosynthesis. In Greek, the scientific name for American mistletoe, *Phoradendron*, means “thief of the tree.” Aristotle (384-322) believed that mistletoe was spontaneously generated, but his pupil, Theophrastus (371-287 BC) wrote that mistletoe grew from seed deposited in bird feces. Anglo-Saxons also knew the origin of these plants as the Old English translation

of mistletoe is “twig dung”. Sticky mistletoe seeds germinate and produce a specialized structure, known as a haustorium. These structures grow through the bark and into the xylem of the host tree to absorb water and nutrients. Eventually, mistletoe shoot growth occurs, forming a shrub on the host plant, without aerial roots. Inconspicuous flowers bloom in late fall and the white sticky berries, borne in small clusters, mature a year later.

European mistletoe is associated with several legendary tales. Greek philosopher, Pliny the Elder (23 to 79 BC) wrote that mistletoe cut from oak trees had mystical healing powers as long as it didn't touch

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Mistletoe Through the Ages *(continued)*

the ground when harvested. In Virgil's (29 to 19 BC) epic poem, "Aeneid", two doves guide the Trojan hero, Aeneas, through a forest to a tree where he discovers mistletoe (i.e., the "golden bough"). After showing the bough to a ferryman, Aeneas is allowed to cross the Stygian river and enter the netherworld. In sacred rituals, Druids cut mistletoe from an oak tree with a golden sickle for a special drink to increase fecundity in barren animals. In Norse mythology, Frigga, the goddess of love and marriage has a son named Baldur who is accidentally slain by his blind brother, using an arrow made from mistletoe wood. Afterwards, Frigga's tears turn into mistletoe berries and Baldur comes back to life. During the Middle Ages, mistletoe was hung from ceilings or above doors to ward off evil spirits and ensure fertility. In Sweden, European mistletoe was kept in homes to prevent fire.

Kissing under a sprig of mistletoe dates back to the 16th century. A poem written in 1826 refers to plucking a berry from the mistletoe after each kiss beneath the bough. In illustrated 19th century versions of Charles Dicken's "The Pickwick Papers", young maidens surround portly Samuel Pickwick for a kiss. Also in some parts of England, mistletoe burned on the twelfth night ensured marriage for those who kiss beneath it. Yet another custom is that couples should kiss under the mistletoe to ensure good luck.

Perhaps one of the earliest accounts of using mistletoe for medicinal purposes was written by Pliny (23 to 79 BC). For the treatment of epilepsy, a mistletoe decoction was administered or the patient carried a sprig of mistletoe with them. Since mistletoe was attached to tree limbs, it couldn't fall to the ground. Thus, it was reasoned that an epileptic carrying mistletoe or had swallowed the decoction, also wouldn't fall to the ground. Interestingly, mistletoe was used to treat this disease up to 1900 AD.

Native Americans used *P. leucarpum* to treat toothaches, measles, cholera, convulsions, hysteria, nervous disorders, and heart problems. However, mistletoe is considered a poisonous plant when ingested. American mistletoe stems, leaves, and berries contain phoratoxin, which can cause blurred vision, nausea, abdominal pain, diarrhea, etc. European plants contain viscotoxin, which tends to be more toxic than American mistletoe. Thus, artificial sprigs of mistletoe are a safe alternative to the live plant, especially around children or pets.

Although mistletoe may be considered a noxious plant by some, it is useful for many animal and insect species. Birds, including grouse, mourning doves, bluebirds, evening grosbeaks, robins and pigeons feed on mistletoe. Others, such as silky flycatchers, several types of owls, red crossbills, house wrens, pygmy nuthatches, chickadees, chipping sparrows, Cassin's finches, pine siskins, etc., use the witches' brooms of mistletoe for nesting sites. Butterflies, including the great purple hairstreak, feed on American mistletoe and the thicket hairstreak and the Johnson's hairstreak feed on dwarf mistletoes. For honeybees and other native bees, nectar and pollen from mistletoe flowers are a food source. Twig beetles, some thrips, a plant bug species, elk, deer, cattle, squirrels, chipmunks, and porcupines also feed on mistletoe. Thus, mistletoe has its place in nature and in our homes as a festive holiday symbol.



December Gardening Calendar

Ornamentals

Weeks 1-4

- Water houseplants with tepid water. Cold tap water may shock plants.
- Be sure newly purchased indoor plants are well protected for the trip home. Exposure to icy temperatures for even a few moments may cause injury.
- Overwintering geraniums like bright light and cool temperatures. Keep soils on the dry side.
- On cold nights, move houseplants back from icy windows to prevent chilling injury.
- Hairspray works well to keep seed heads and dried flowers intact on wreaths and arrangements.
- If you plan to have a live Christmas tree, dig the planting hole before the ground freezes. Mulch and cover the backfill soil and the planting hole to keep them dry and unfrozen. When you get the tree, store it outdoors in a cool, shady, windless area until the last minute and mulch the roots to prevent cold injury. Don't allow the tree's roots to become dry and spray the needles with an anti-transpirant to reduce moisture loss. Set the tree up in your coolest room. Don't keep the tree indoors for more than one week and plant outdoors promptly.
- Be sure the root zones of azaleas and rhododendrons are thoroughly mulched. Any organic material will do, but mulches made from oak leaves, shredded oak bark, or pine needles are preferred.

Weeks 2-4

- Holiday poinsettia plants do best with sun for at least half the day and night temperatures in the 50's or 60's. Keep plants away from drafts, registers and radiators and let the soil should dry only slightly between thorough waterings. Be sure to punch holes in decorative foil wraps to prevent soggy soil conditions.

Weeks 1-3

- Christmas trees hold needles longer if you make a clean, fresh cut at the base and always keep the trunk standing in water.
- Only female holly trees bear the colorful berries. There must be a male tree growing nearby for pollination, if fruits are desired.
- Hollies may be trimmed now and the prunings used in holiday decorations.

Miscellaneous

Week 1

- Apply mulches to bulbs, perennials and other small plants once the ground freezes.
- All power equipment should be winterized before storage. Change the oil and lubricate moving parts. Either drain fuel systems or mix a gas stabilizing additive into the tank.
- Clean and oil all garden hand tools before storing for winter.
- If you feed rabbits corn or alfalfa, they may leave fruit tree bark unharmed.

*Gardening Calendar supplied by the staff of the William T. Kemper Center for Home Gardening located at the Missouri Botanical Garden in St. Louis, Missouri.
(www.GardeningHelp.org)*

Bittersweet for Autumn Decoration *Michele Warmund*



While cranberry and pumpkin are plants native to the Americas that help satiate the palate at Thanksgiving, bittersweet is an American plant that can please the eyes. It is useful both in the home for Thanksgiving decoration or outdoors in the landscape. This woody vining plant with attractive orange-red berries grows in the wild over a goodly part of North America. Bittersweet not only adds color in the landscape at a time when color from other plants is sparse, it also is an important food source for birds. Its berries normally remain attractive until very cold weather causes them to darken and collapse.

The common name bittersweet is thought to have been given to the plant by 18th century European colonists who thought its fruits resembled those of European nightshade, a plant native to Eurasia that carries the common name of bittersweet. Today, the name is applied to two dioecious species of the genus *Celastrus*. American bittersweet (*Celastrus scandens*) is commonly found along roadsides or on fences in central and eastern parts of the United States. Although a vigorous grower, it is not considered to be invasive. All parts of the plant are considered to be toxic, even though it is thought that Native Americans used the berries for medicinal purposes such as treating intestinal disorders.

Oriental bittersweet (*Celastrus orbiculatus*) was introduced from the Orient in the 19th century to be used as a landscape plant. It produces a greater abundance of berries than American bittersweet that (apparently) are more attractive to birds as a food source. As a result, Oriental bittersweet has spread to the wild where, although a colorful plant, it has become a threat to other vegetation. Oriental bittersweet can wrap itself so tightly around the trunk of small trees that it can strangle them by girdling and restricting sap flow. Additionally, it is capable of robbing nearby plants of needed nutrients. Oriental bittersweet also is considered to be toxic.

The easiest way to differentiate between the two is to note the size and location of the berries. Oriental bittersweet produces smaller berries in clusters produced from the leaf axils or near the ends of its shoots. American bittersweet produces larger berries in clusters at the terminals, or ends, of the lateral vines. In both cases the berries are borne in yellowish capsules that split open in the fall to reveal a bright orange-red aril. The latter is a botanical term given to the fleshy covering of a seed.

Gardeners contemplating adding bittersweet to their landscape either for themselves or for the sake of birds should choose the “better behaved” American bittersweet. Although not invasive, it is a vigorous vine that climbs by twining. American bittersweet can climb 20 feet or more into trees or anything that is nearby. When there is nothing to climb, such as when it is located on large slopes, it tends to sprawl over the ground and becomes a loosely-tangled groundcover.

Bittersweet is easy to grow and winter hardy through zone 3. It adapts well to many soil types and is a good choice for poor soils, where its growth will be less rampant. Additionally, it has no major insect or disease problems. Given its natural vigor, bittersweet should be cut back severely each winter to allow new growth to develop the subsequent spring. Bittersweet tolerates both sunny and shady exposures, but sun is needed for the plant to fruit well. It rarely requires supplemental water and is generally self-reliant.

Bittersweet can be started from seeds or cuttings. Since it is dioecious, fifty percent of the seeds of bittersweet will produce male plants and fifty percent female. Unfortunately, it is not possible to tell the sexes apart until the vines become large enough to flower. For good berry production, both sexes must be present. Where space is limited, plant at least three plants close together. This (hopefully) will result in a mix of both sexes.

When growing bittersweet from seeds, make sure the berries are mature. Remove the orange-red aril around the seeds and plant them immediately. Bittersweet seeds need about three months of cold temperatures to break dormancy and germinate. Planting seeds in a coldframe or other protected location outdoors often is the most convenient way to give them to the required cold treatment.

Alternatively, bittersweet can be produced from cuttings of plants whose sex is known. If the parent plant produced berries, it is female. Plants that have never produced berries most likely are males, although they could be female plants that lack the proper environment for flowering. Cuttings of bittersweet are fairly easy to root either as softwood cuttings in summer or dormant cuttings in winter.

Cuttings taken in early to midsummer should be treated with a root-promoting hormone (e.g. IBA) and placed in conditions of high humidity. Sterile sand, vermiculite or a potting mix blend make ideal rooting media. Covering the cuttings with a plastic bag will help prevent desiccation; placing the cuttings in a lightly shaded area will help prevent temperatures under the bag from becoming too warm. The plastic bag should be removed as soon as cuttings have rooted. The latter can be determined by pulling lightly on the cuttings to see if their roots are holding.

There is a fine line between an aggressive but attractive ornamental plant and an invasive weed. Bittersweet skirts that boundary. For gardeners who want fall color from berries and a plant that attracts birds, bittersweet merits consideration.