

WHITELEAF MANZANITA

Arctostaphylos manzanita Parry

Plant Symbol = ARMA

Common Names: Common manzanita

Scientific Names: *A. manzanita* Parry ssp. *elegans* (Eastw.) P.V. Wells, *A. manzanita* Parry ssp. *glaucescens* P.V. Wells, *A. manzanita* Parry ssp. *laevigata* (Eastw.) Munz, *A. manzanita* Parry ssp. *manzanita*, *A. manzanita* Parry ssp. *roofii* (Gankin) P.V. Wells, *A. manzanita* Parry ssp. *wieslanderi* P.V. Wells

Description

General: The genus *Arctostaphylos* consists of trees and shrubs in the Ericaceae family, with the majority native to California, characterized by reddish bark and, evergreen leaves. (Stuart and Sawyer, 2001). Different manzanita species often hybridize causing identification to species to be difficult when distribution and habitats overlap (Abrahamson, 2014; Parker et al., 2012; Stuart and Sawyer, 2001). Whiteleaf manzanita is an erect and spreading, tree-like shrub growing from 6 to 25 feet in height (Figure 1). The stems and twigs are mahogany colored, smooth and hairless. The leaves are erect, entire, and flat with a petiole, the leaf blade is oblong-ovate to obovate 1 -2 inches in length and 0.4 -1.4 inches in width. The leaves are evergreen although the shade can vary from bright green to greyish or blueish green and may be shiny or dull. The surface of the leaf can be smooth and hairless or have stiff hairs, veins are non-glandular but may have hairs, the leaf tip is acute, and the leaf margin is entire (Figure 2). The flowers on whiteleaf manzanita are arranged on a panicle with 2 – 7 branches that hang down and subtend the flowers. The flower shape is round with five white to pinkish lobes, often referred to as urn or bell shaped (Parker et al., 2012). The flowering period is from January to March (Calflora, 2018). The fruit are berry-like drupes, spherical, 0.3 – 0.5 inches in diameter and resemble tiny apples (the Spanish name for apple is *manzana*). Seed production is typically abundant, and fruits ripen from early to late summer through early fall and remain on the tree (Parker et al., 2012; Stuart and Sawyer, 2001). The fruits contain 3 to 4 seeds protected by a dense impervious layer of tissues derived from the flower (Abrahamson, 2014). Common manzanita may have a tap root, but older plants typically have a shallow root system (Abrahamson, 2014).



Figure 1. Whiteleaf manzanita trees growing in the Sierra Foothills in California. Photo: USDA, Lockeford Plant Materials Center.

There are currently six recognized subspecies with limited distribution areas apart from the type subspecies:

- *manzanita* ssp. *elegans*, Konocti manzanita. Limited to the North Coast and Klamath Ranges, blooms from February through May, and stones in the fruit are generally fused (Calflora, 2018; Parker et al., 2012).
- *manzanita* ssp. *glaucescens*, Whiteleaf manzanita. This subspecies is limited to the Outer North Coast Range, it blooms from February through May, the stones in the fruit are free (Calflora, 2018; Parker et al., 2012).
- *manzanita* ssp. *laevigata* Contra Costa manzanita. This subspecies is limited to the Vaca Mountains of the North Coast Range and around Mount Diablo located on the east of the San Francisco Bay. The leaves are shiny and bright green, with 2-4 pinkish white flowers to each panicle and the stones free in the drupe. Bloom is from February through May (Calflora, 2018; Parker et al., 2012).
- *manzanita* ssp. *manzanita*, Whiteleaf manzanita. The most common of the subspecies, variable and found throughout the range. Leaf color varies from bright green to dull. Stones are free (Calflora, 2018; Parker et al., 2012).
- *manzanita* ssp. *roofii*, Roof's manzanita. This subspecies is limited to the Interior North Coast Ranges and Cascade Range Foothills, with one occurrence further south in Butte County. There is a prominent burl at the base of the stem, which makes the plant more resistant to fire. Bloom is from February through May. Stones are free or partly fused in the fruit (Calflora, 2018; Parker et al., 2012).

- *manzanita* ssp. *wieslanderi*, Wieslander's manzanita. This subspecies is limited to the High North Coast Ranges and the Cascade Range Foothills. The leaves are dull green, scabrous and glandular hairy. Stones are free, and bloom is from February through May (Calflora, 2018; Parker et al., 2012).

Description

Distribution: Whiteleaf manzanita is endemic to California, although most subspecies have limited distributions, the type subspecies *A. manzanita* ssp. *manzanita*, is found from the North Coast Ranges, eastward to the Cascade Range and Sierra Nevada foothills at elevations of 100 to 4,900 feet (Abrahamson, 2014; Parker et al., 2012). For current distribution, please consult the Plant Profile page for this species on the PLANTS Website.

Habitat: Whiteleaf Manzanita is found in chaparral, foothill woodland, especially blue oak, *Quercus douglasii*, woodland, Northern oak woodland and yellow-pine forests, and redwood-Douglas fir in the inland North Coast ranges. It occurs on rocky slopes, woodlands, coniferous forest, sandstone outcrops, shale outcrops, subalpine forest, serpentine soils, ridges and open areas (Abrahamson, 2014; CalFlora, 2018; Parker et al., 2012).

Adaptation: Whiteleaf manzanita grows on a variety of soil types including, sand, clay, and occasionally serpentine soils. They tolerate poor soils and xeric conditions and are most common on dry rocky sites (Abrahamson, 2014; Parker et al., 2009). The plants are fire adapted, although a moderate fire will kill the plants. Fire also activates seed in the seed bank to germinate. The plants require full sun, seedling recruitment is poor in shaded situations. Whiteleaf manzanita plants are strongly mycorrhizal with ectomycorrhizal associations supporting their growth in poor soils (Acsai and Largent, 1983). It is an associated species in most communities, but in areas such as the Napa Ranges and the middle, upper, and North Coast Ranges, it may form closed impenetrable thickets of forest-like growth (Abrahamson, 2014).

Uses

Wildlife: Whiteleaf manzanita is an important plant for California Wildlife. The plants provide cover and browse for deer, although the nutritional value of the leaves and twigs is low, especially new growth in spring (Sampson and Jespersen, 1963). The flowers produce nectar and are visited by native bees and other beneficial insects, making whiteleaf manzanita a suitable early blooming hedgerow plant (Earnshaw, 2018; Mader, 2011). The fruit provides wildlife food over the summer and fall including deer, raccoon, skunks, ground squirrels, coyote, and bears (Abrahamson, 2014; Reed, 2006). The plants provide cover and insect forage to numerous bird species (Abrahamson, 2014; Sibley, 2000).

Ornamental: Whiteleaf manzanita is an attractive ornamental plant, with its mahogany colored trunks and stems, green foliage throughout the year, and beautiful whitish pink flowers in early spring. It is very drought tolerant (Theodore Payne, 2014). Several cultivars are available commercially.

Ethnobotany

Whiteleaf manzanita is a culturally significant multiple uses plant for the native tribes in California. The berries are highly valued for making a cider drink, food, medicinal properties. The wood is valuable for making tools and utensils and is excellent firewood. The berries were collected from the manzanita bush by hand picking into burden baskets that were hung around the neck or by using flat sifting baskets placed underneath the shrub. The branches would then be shaken, and the berries would collect into the baskets (Barrett and Gifford, 1933; Dubois, 1935).

Many California tribes including the Karok, Maidu, Miwok, Wintu, and Yuki made a delicious cider from the berries (Barrett and Gifford, 1933; Chestnut, 1902; Durbin and Tolley, 2008; Merriam 1967, Schenk and Gifford, 1952). In making cider, the berries were crushed, and an equal volume of water was poured over the crushed berries. The mixture was poured into a straining basket (sometimes with an additional layer of pine needles or dry grass), to be collected into a waterproof basket below (Figure 3) (Chestnut, 1902). If any of the berries passed through, the liquid would be decanted (Barrett and Gifford, 1933; Du Bois, 1935). The Indians at Chowchilla filtered manzanita cider using deep round openwork bowl baskets (Merriam, 1955). The beverage would keep without souring for up to four days. The cider was sweet and drunk before fermentation because fermentation would make it sour (Barrett and Gifford, 1933; Du Bois, 1935). A modern recipe simmers green berries for 15 minutes, bruising, leaving overnight and then decanting, sweetening with honey if needed (Dubin and Tolley, 2008).



Figure 2. Whiteleaf manzanita in bloom in the Sierra Foothills, January 2018. Photo: USDA, Lockeford Plant Materials Center.

The berries were eaten raw in limited amounts as they are tart and indigestible, although valuable to suppress thirst (Chestnut, 1902). Tribes in the Yosemite region chewed the berries for flavor, but did not swallow them (Barrett and Gifford, 1933). Elders remember drinking the sweet juice straight from pounding holes while lying on their stomachs as children (Bibby and Aquilar, 2005). The Maidu pounded the berries in mortars and ate them without other treatment (Merriam 1967). The Yuki ate the ripe berries raw and parched and used them with ground seeds of other plants in pinole (Curtin, 1957). The ground manzanita berries were a staple food, used as a pinole, a porridge and a bread and dried and stored for winter for many tribes including the Numlaki and Wintu (Chestnut, 1902; Harrington, and Bocek, 1984). Anthropologist Cora Du Bois (1935) describes the processing and cooking of the berries among the Wintu: "Berries pounded into coarse flour, dampened, next morning dried and parched with hot rocks. Winnowed. Fine flour boiled with water and made into sweetish soup". The Karok dried the berries in the sun then stored them in baskets, the dried berries were sometimes pounded with salmon eggs and cooked in baskets with hot rocks (Schenk and Gifford, 1952).

Whiteleaf manzanita was also used medicinally among Native American tribes. The Wintu and Pomo tribes used the leaves in tea to alleviate diarrhea and they soaked the leaves to relieve poison oak symptoms, cold symptoms, and headaches (Chestnut, 1902). The Miwok tribes chewed the leaves to help ease pain associated with cramps and stomachaches (Barrett and Gifford, 1933). The Concow applied a poultice of the chewed leaves to sores (Chestnut, 1902).

The wood of Whiteleaf manzanita is strong and was used for tools, such as spoons, scraping sticks for acorn soup and reels for sting, walking and carrying sticks (Schenk and Gifford, 1952). Chestnut (1902) reports that some tribes including the Yuki and Pomo used two V- shaped pieces, about a yard in height and curved on one side, for carrying large loads of wood. The pieces were stacked onto the forks, then the straight pieces were grasped with both hands and slung onto the back. This allowed carrying of heavy loads of wood. Manzanita wood makes excellent firewood, burning hot and steadily, it burns fast and so was usually burned with more slowly burning wood, such as oak (Chestnut, 1902). Manzanita wood is recommended today for smoking and cooking both fish and meats (Dubin and Tolley, 2008).

Indigenous stewardship method traditionally used for management of this plant is frequent cool temperature prescribed burns. Today these burns are typically carried out after fall rains, so that the flames proceed slowly through the dead grasses and herbaceous vegetation. Whiteleaf manzanita continues to be locally abundant, apart from the subspecies with limited distribution (Parker et al., 2012).

Status

Threatened or Endangered: Two whiteleaf manzanita subspecies are listed by the California Native Plant Society Rare Plant Bank: *A. manzanita* ssp. *elegans*, Konocti manzanita is ranked 1B.3 and *A. manzanita* ssp. *laevigata* Contra Costa manzanita as 1B.2. This listing includes plants rare, threatened, or endangered in California and elsewhere.

Weedy or Invasive: This plant may become weedy or invasive in some regions or habitats and may displace desirable vegetation if not properly managed. Please consult with your local NRCS Field Office, Cooperative Extension Service office, state natural resource, or state agriculture department regarding its status and use.

Please consult the PLANTS Web site (<http://plants.usda.gov/>) and your state's Department of Natural Resources for this plant's current status (e.g., threatened or endangered species, state noxious status, and wetland indicator values).

Planting Guidelines

Germination of whiteleaf manzanita seeds is generally poor without scarification and fire (Berg, 1974). Container grown plants of whiteleaf manzanita should be transplanted with fall rains and provided with limited irrigation for the first two years until established.

Management

Whiteleaf manzanita is a fire adapted plant with estimated burn intervals of 30 to 50 years. A moderate intensity burn will kill the plants but also activate seed to germinate in the year following the fire. A high intensity burn may not only kill the plants but also the seeds, if the temperatures in the soil are hot enough (Abrahamson, 2014).

Pests and Potential Problems

Whiteleaf manzanita is regulated as a host to Sudden Oak Death, *Phytophthora ramorum* (USDA APHIS, 2013). Symptoms of the disease include lesions on leaves and stems are found in the field and these have been duplicated on plants in the laboratory (Davidson et al., 2003; Rizzo and Garbelotto, 2003).

Environmental Concerns

Whiteleaf manzanita stands are highly flammable, due to the resinous leaves and hot burning wood (Abrahamson, 2014). Brush removal is often advised for fire suppression around buildings and for Forest Management.

Control

Please contact your local agricultural extension specialist or county weed specialist to learn what works best in your area and how to use it safely. Always read label and safety instructions for each control method. Trade names and control measures appear in this document only to provide specific information. USDA NRCS does not guarantee or warranty the products and control methods named, and other products may be equally effective.

Seeds and Plant Production

Fruits are collected from the plants by hand or picked up off the ground. The outer fleshy part of the fruit must be macerated and separated from the seeds. *Arctostaphylos* spp. have hard seed coats and dormant embryos. Under natural conditions dormancy is broken by fire, and treatments such as sulfuric acid scarification or simulated burning under pine needles is required to break dormancy (Berg, 1974). Seedlings planted in flats may be transplanted to containers and planted out with fall rains. Manzanita are easier to propagate from cuttings than from seed. For vegetative propagation, cut the semi-mature previous season's growth between December and January. "Treat with a hormone solution for 10 seconds. Place in medium that is 1 peat: 10 perlite rooting mix" (Hart, 2005). Place in a shaded area outside, mist and water as necessary. After roots have established, place in a medium of "1 sand: 7 peat: 7 perlite." Whiteleaf manzanita requires proper drainage and aeration in the soil.

Cultivars, Improved, and Selected Materials (and area of origin)

There are three named cultivars: from the Napa Area of California 'Byrd Hill' is a compact form growing no more than 8 feet tall and 'Saint Helena' collected from Mount St Helena is slightly larger growing to 10 feet tall, 'Dr. Hurd' grows taller to 15 feet tall and originates from Saratoga, to the south of the San Francisco Bay (Theodore Payne, 2014).

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