## Madrones are difficult to transplant (see below excerpts from Wikipedia and OSU Extension Center)

The trees are difficult to transplant and a seedling should be set in its permanent spot while still small. Transplant mortality becomes significant once a madrona is more than 1 foot (30 cm) tall. The site should be sunny (south- or west-facing slopes are best), well drained, and lime-free (although occasionally a seedling will establish itself on a shell midden). In its native range, a tree needs no extra water or food once it has become established. Water and nitrogen fertilizer will boost its growth, but at the cost of making it more susceptible to disease.[citation needed]

Although drought tolerant and relatively fast growing, Arbutus menziesii is currently declining throughout most of its range. One likely cause is fire control; under natural conditions, the madrona depends on intermittent naturally occurring fires to reduce the conifer overstory. Mature trees survive fire, and can regenerate more rapidly after fire than the Douglas firs with which they are often associated. They also produce very large numbers of seeds, which sprout following fire.

Increasing development pressures in its native habitat have also contributed to a decline in the number of mature specimens. This tree is extremely sensitive to alteration of the grade or drainage near the root crown. Until about 1970, this phenomenon was not widely recognized on the west coast; thereafter, many local governments have addressed this issue by stringent restrictions on grading and drainage alterations when Arbutus menziesii trees are present.[citation needed] The species is also affected to a small extent by sudden oak death, a disease caused by the water-mold Phytophthora ramorum.

Madrones are notoriously difficult to transplant. Some authorities recommend buying seedlings that have been marked with north or south on the seedling tube so that you can plant the tree with the same orientation it's been used to. Since madrones don't tolerate having their roots disturbed, buy the smallest ones you can find. Use exceptional care planting even small seedlings, not to cramp the roots. To increase your chances of success, buy and plant more than you think you really want. You can always dig the extra ones up later – or just enjoy having more madrones than you'd planned on.

One theory to explain why madrones are so difficult to transplant is that they rely heavily on a complex relationship with fungal filaments in the soil. These fungal filaments grow together with plant roots to form extensive networks called myccorhizae. These bring additional water and nutrients to the plant. Myccorhizae can increase the working surface area of the roots by as much as a thousand-fold.

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