

**Plant Propagation Protocol for [*Arbutus Menziesii*]**

ESRM 412 – Native Plant Production

URL: [https://courses.washington.edu/esrm412/protocols/\[2021\]/\[ARME.pdf\]](https://courses.washington.edu/esrm412/protocols/[2021]/[ARME.pdf])

<b>TAXONOMY</b>	
Plant Family	- Ericaceae
Scientific Name	Arbutus Menziesii
Common Name	Pacific Madrone
<b>Species Scientific Name</b>	
Scientific Name	Arbutus Menziesii
Varieties	No naturally occurring varieties
Sub-species	
Cultivar	
Common Synonym(s)	
Common Name(s)	Madrone, pacific madrone, bearberry, Madrona, madroo, madroa, Strawberry Tree
Species Code (as per USDA Plants database)	ARME
<b>GENERAL INFORMATION</b>	
Geographical range	Occurs in the coastal regions of the Pacific Coast, from Southern California to Northern British Columbia. Usually on western side of the coastal mountain ranges. [9] [6]
Ecological distribution	<p>Grows on variety of terrain. Flats and gradual hills to steep slopes. Often congregates around riparian areas (such as creeks and rivers), facing south/west in the more northern part of it's ranges. In southern parts, such as in Southern California, it will be found in cool canyons and north facing slopes in wooded areas.</p> <p>In northern parts of it's range it grows in forested and wooded areas along the coast.</p> <p>Grows on variety of soils, but prefers rocky, and well drained soils. [2] [6]</p>
Climate and elevation range	<p>Prefers mild oceanic winters. Can withstand precipitations from 15 to 166 inches (growing taller with more precipitation in it's northern ranges)</p> <p>Can survive in drought tolerant conditions, but can be killed if exposed to frost for too long (&lt;14 Fahrenheit).</p> <p>Usually occurs along sea level, but can be found in it's southern ranges up into 4,000 feet of elevation. Usually</p>

	<p>higher in elevation when occurring further inland. Northern ranges it occurs much closer to the coast, up to 3000 feet. In colder areas, will prefer south facing slopes with greater UV radiation and lower soil moisture content.</p> <p>[2] [6]</p>
Local habitat and abundance	<p>Southern Ranges – Can be found living within coastal redwood forests and mixed evergreen forests. [2]</p> <p>Northern – Found more in forested/mixed evergreen along with coastal redwood forests. Associated species include Doug Fir, Western Hemlock, various oaks (<i>Q. agrifolia</i>, <i>chrysolepis</i>, <i>wisleyenii</i>). [2]</p> <p>Rarely produced pure/large stands of Madrone, usually found individually or in groves. [6]</p>
Plant strategy type / successional stage	<p>Madrone would be classified as sub climactic in successional stages. Needs sufficient light to survive, rarely found as an understory plant. But can grow up to 100 feet so can present in climax stages [2]</p>
Plant characteristics	<p>Tree, can grow around 100 feet (up to 130) in areas with more precipitation, 25-30 feet in drier areas. 2-3 feet in diameter. Peeling bark, that is a dark red. But once fully peeled becomes very smooth and lighter in color. [2] [6]</p>
<b>PROPAGATION Details</b>	
Ecotype	
Propagation Goal	Plants
Propagation Method	Seed and vegetative (naturally produces asexually more than by seed) but will focus on nursery seed production
Product Type	<p>Container from seed</p> <p>[3]</p>
Stock Type	
Time to Grow	One full season, but can be kept in larger pots for longer
Target Specifications	<p>After 2-4 true leaves appear, or, a minimum of 4 months.</p> <p>[3]</p>
Propagule Collection Instructions	<p>Collect in early winter, as the fruits are a favorite of birds. Collect from younger trees, collecting fruits off fully mature (70+ feet) tall trees is difficult.</p> <p>White/tan seeds are not mature enough, blackish/brown is a ripe seed that is more viable.</p>

	[3]
Propagule Processing/Propagule Characteristics	<p>Wet Method – soak fruits for few days in water. Then remove the fruits, and mash them. Put them through a mesh screen, big enough for the seeds to sort through. The flesh of the fruits will get stuck on the screen, while pushing the seeds through.</p> <p>A good sample size for seedlings is 300-400 (if not then the seeds become too difficult to separate)</p> <p>Dry Method – Let fruits dry. Once fully dry they can be grounded into a powder and the seeds then become easily separated.</p> <p>Can store dry seeds for up to 2 years max.</p> <p>630-1130 seeds/ pound</p> <p>[4] [5]</p>
Pre-Planting Propagule Treatments	<p>Stratify for 60-90 days in refrigerator. Put in potting mix into a plastic bag with seeds, moisten the potting medium and shake.</p> <p>[8] [10]</p> <p>(Check [3] and [5] for mixed results on germination testing)</p>
Growing Area Preparation / Annual Practices for Perennial Crops	<p>Fine seedling mix (starter mix, coco coir with perlite). Set in flats after stratification.</p> <p>Once they set out their first two cotyledons, then they can be moved into four inch containers (very delicate process as new <i>Arbutus</i> have sensitive roots)</p> <p>Are easily transplanted into larger containers</p> <p>[10]</p>
Establishment Phase Details	Set in flats after stratification. Put in fine seeding mix and sprinkle more fine seeding mix or vermiculite on top of seeds in the flat. This is because seeds need light to germinate. Keep seeds warm at 68-80 F. [4]
Length of Establishment Phase	2 months [10]
Active Growth Phase	Transplanted into 4 inch pots. Can be kept in larger pots for longer before out planting if necessary. [4]
Length of Active Growth Phase	1-2 years, but can be transplanted after about 1 season [4] [10]
Hardening Phase	Kept in warm, relatively dry conditions in large pots.

	A month or two before transplanting, gradually decrease temperatures to get seedlings prepared for out planting
Length of Hardening Phase	One full growing season (2-3 months). Kept at optimal conditions, <i>Arbutus</i> Madrone can be kept in large containers for up to 2 years.
Harvesting, Storage and Shipping	Can be moved around in large pots.
Length of Storage)	2 years max, because roots are sensitive to disturbance, but can do well in large containers
Guidelines for Outplanting / Performance on Typical Sites	Roots are sensitive to transplant. For best results, separate roots by cutting downwards. Straighten and spread roots before transplanting. For equally good results, wash the potting substrate off of the roots and cut the bottom 3 <sup>rd</sup> of the roots before transplanting. [10]
Other Comments	From my research, a common consensus is propagating <i>A. Menziesii</i> from seed is difficult, and often ends in high mortality rate. One field of reasoning is that the Madrone makes associations with mycorrhiza in the soil that it depends on for survival, and when transplanted, loses its associations and thus suffers from disturbance. Hardening off is important.
<b>INFORMATION SOURCES</b>	
References	
Other Sources Consulted	
Protocol Author	
Date Protocol Created or Updated	

## Works Cited

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