

Plant Propagation Protocol for *[Insert Species]*

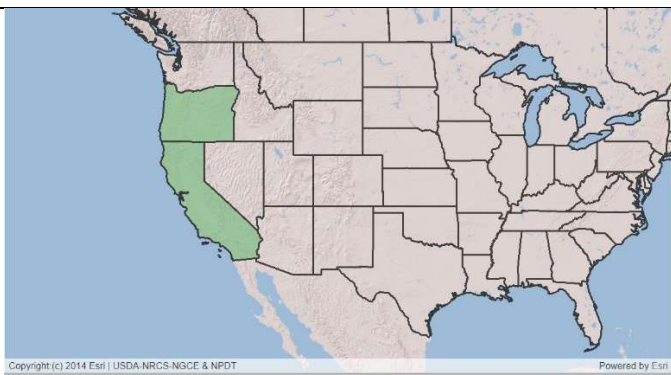
ESRM 412 – Native Plant Production

URL: [https://courses.washington.edu/esrm412/protocols/\[2021\]/\[ARHI5\]](https://courses.washington.edu/esrm412/protocols/[2021]/[ARHI5])



California Native Plant Society, Rare Plant Program

TAXONOMY	
Plant Family	
Scientific Name	<i>Ericaceae</i>
Common Name	Heath
Species Scientific Name	
Scientific Name	<i>Arctostaphylos hispidula</i> Howell
Varieties	- <i>Arctostaphylos hispidula</i> Howell var. <i>viscosissima</i> M. Peck
Sub-species	- <i>Arctostaphylos pungens</i> Kunth ssp. <i>hispidula</i> (Howell) J.B. Roof - <i>Arctostaphylos stanfordiana</i> Parry ssp. <i>Hispidula</i> (Howell) J.E. Adams
Cultivar	N/A
Common Synonym(s)	- <i>Arctostaphylos hispidula</i> Howell var. <i>viscosissima</i> M. Peck - <i>Arctostaphylos pungens</i> Kunth ssp. <i>hispidula</i> (Howell) J.B. Roof - <i>Arctostaphylos stanfordiana</i> Parry ssp. <i>Hispidula</i> (Howell) J.E. Adams
Common Name(s)	Howells Manzanita or Gasquet Manzanita
Species Code (as per USDA Plants database)	ARHI5
GENERAL INFORMATION	
Geographical range	Howell's Manzanita is native to the coastal mountain ranges of southern Oregon and northern California ^[8] . It can be found in the Klamath ranges and outer north coast ranges ^[4] .

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Ecological distribution	Howell's Manzanita is mostly found in interior chaparral or open woodland ecosystems that are near the ocean (1-30 miles) ^[2] . It prefers a sparse forest or scrub area with moderately deep ultramafic serpentine soils ^[4] .
Climate and elevation range	It occupies elevations from 100-1,250 meters and is mostly located in chaparral ecosystems which are characterized by dry, hot summers and mild, wet winters, receiving moderate rainfall each year ^[2]
Local habitat and abundance	It is found in open areas, balds, and rocky outcroppings of coastal mountain ranges in the Klamath Mountains or the outer north coast ranges of California/ southern Oregon, often in serpentine soils ^[4] . Associate species are Western Hemlock, Douglas Fir, Hairy Manzanita, Huckleberry Oak, Coffeeberry, Siskiyou Mat, Pinemat Manzanita, and Canyon Live Oak ^[4] .
Plant strategy type / successional stage	Manzanita is an obligate seeder, and is often found where other shrubs are not as dominant, such as the edges of habitats near the ocean ^[4] .
Plant characteristics	Howells manzanita is a shrub, reaching 1-3 meters in height ^[2] ^[6] . It has bristly shoots and leaves, with spreading or erect stems that are fine, glandular, and hairy ^[1] ^[4] . The leaves are elliptic to oblanceolate, with a wedge shaped base, and have a dull or shiny dark green color ^[4] . The flowers are white, brown, or pink and urn-shaped, growing in clusters ^[1] . The fruit are tan or white and roughly 5-7 mm wide ^[1] .
PROPAGATION DETAILS	
Ecotype	Likely collected from the coastal ranges of Northern California or Southern Oregon.
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Container (plug)
Stock Type	N/A
Time to Grow	>1 year
Target Specifications	The plant should be firmly rooted in the container prior to outplanting ^[6] .
Propagule Collection Instructions	Seeds can be collected from June to September, either by hand or stripped from the plant ^[5] .

Propagule Processing/Propagule Characteristics	The seeds have a density of roughly 17,00-25,000 seeds/ pound, and can presumably last up to ten years in storage ^[5] ^[9] .
Pre-Planting Propagule Treatments	To prepare the seeds, they first must be cleaned. This can be done either by soaking the seeds or drying them. To separate the fruit from the seed, macerate the seeds and then soak in water to separate the fruit from seed ^[5] . One can also dry the fruits and then separate the seed using a series of screens ^[5] . Many of the seeds can imbibe water without any pretreatment, however, some species of manzanita have used either acid scarification (3-15 hrs) or heat/ smoke treatment (to simulate wildfire) ^[5] .
Growing Area Preparation / Annual Practices for Perennial Crops	Howells manzanita prefers ultramafic serpentine soils, so growing media should likely mimic these conditions ^[4] .
Establishment Phase Details	For a similar species of manzanita, a special seed germination mix was used, containing a 1:1 ratio of sunshine professional growing mix with sand ^[6] . Additionally, a 4:1:1 mix of peat, perlite, and compost was used ^[6] . Lastly, a slow release fertilizer was used (14N:14P2O5:14K2O) ^[6] . Water overhead as needed ^[6] . Note: Based on propagation technique for similar species
Length of Establishment Phase	Several months ^[6]
Active Growth Phase	After the seedlings have established, they can be transplanted into containers with a 4:1:1 mix of peat, perlite, and organic compost ^[6] . Time release fertilizer is used (9 month, 14N:14P2O5:14K2O) as ½ cup per 0.75 cubic yards of medium ^[6] . Note: Based on propagation technique for similar species
Length of Active Growth Phase	N/A
Hardening Phase	The plants are hardened by placing them outside in full sun for 2 weeks ^[6] . Note: Based on propagation technique for similar species
Length of Hardening Phase	2-4 weeks ^[6] .
Harvesting, Storage and Shipping	Ideally outplanted during months of higher soil moisture ^[6] .
Length of Storage	This is dependent on the outplanting date, thus, it can be variable ^[6] .
Guidelines for Outplanting / Performance on Typical Sites	N/A
Other Comments	N/A

INFORMATION SOURCES

References	<p>[1]“Howell's Manzanita, <i>Arctostaphylos Hispidula</i>.” <i>California Native Plant Society</i>, calscape.org/Arctostaphylos-hispidula-().</p> <p>[2]<i>Arctostaphylos Hispidula</i>, Regents of the University of California, ucjeps.berkeley.edu/eflora/eflora_display.php?tid=13929.</p> <p>[3]“Howell's Manzanita.” <i>Plants</i> 3, USDA, plants.usda.gov/home/plantProfile?symbol=ARHI5.</p> <p>[4]Emerson, Clint. “Conservation Assessment for Gasquet Manzanita (<i>Arctostaphylos Hispidula</i>).” <i>Conservation Assessment</i>, U.S.D.A. Forest Service Region 6 and U.S.D.I. Bureau of Land Management Interagency Special Status and Sensitive Species Program, Mar. 2010, www.fs.fed.us/r6/sfpnw/issssp/documents/planning-docs/ca-va-arctostaphylos-hispidula-2010-03.pdf.</p> <p>[5]Meyer, Susan E. “<i>Arctostaphylos Adans. Manzanita</i>.” <i>Arctostaphylos Adans.: Manzanita</i>, US Forest Service.</p> <p>[6]Herrera, Mike; Takara, Janet. 2006. Propagation protocol for production of Container (plug) <i>Arctostaphylos catalinae</i> P.V. Wells plants Catalina Island Conservancy Avalon, California. In: Native Plant Network. URL: http://NativePlantNetwork.org (accessed 2021/05/26). US Department of Agriculture, Forest Service, National Center for Reforestation, Nurseries, and Genetic Resources.</p> <p>[7] California Native Plant Society, Rare Plant Program. 2021. Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.39). Website http://www.rareplants.cnps.org [accessed 26 May 2021].</p> <p>[8] Calflora: Information on California plants for education, research and conservation, with data contributed by public and private institutions and individuals, including the Consortium of California Herbaria. [web application]. 2021. Berkeley, California: The Calflora Database [a non-profit organization]. Available: https://www.calflora.org/ (Accessed: 05/25/2021)</p> <p>[9] Mirov, N.T., and C.J. Kraebel. “Collecting and Propagating the Seeds of California Wild Plants.” <i>Collecting and Propagating the Seeds of California Wild Plants</i>, US Forest Service Department of Agriculture, 28 Dec. 1937.</p>
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Other Sources Consulted	<p>Schmitt, Doug. <i>Plant Data Sheet</i>, University of Washington, n.d., depts.washington.edu/propplnt/Plants/Arctostaphylos_patula.htm.</p> <p>Kathleen, et al. "The Manzanita." <i>California Native Plant Society</i>, 3 Apr. 2018, www.cnps.org/gardening/the-manzanita-5559.</p> <p>"Pacific Horticulture Society: Arctostaphylos for Pacific Northwest Gardens." <i>Pacific Horticulture</i>, 17 Apr. 2020, www.pacifichorticulture.org/articles/arctostaphylos-for-pacific-northwest-gardens/.</p> <p><i>MANZANITAS, CALIFORNIA'S "LITTLE APPLES,"</i> Nativeplants.org, n.d., www.nativeplants.org/wp-content/uploads/manzanitas.pdf.</p> <p>California Native Plant Society, Rare Plant Program. 2021. Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.39). Website http://www.rareplants.cnps.org [accessed 26 May 2021].</p>
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