

Plant Propagation Protocol for *Arctostaphylos patula*
ESRM 412 – Native Plant Production



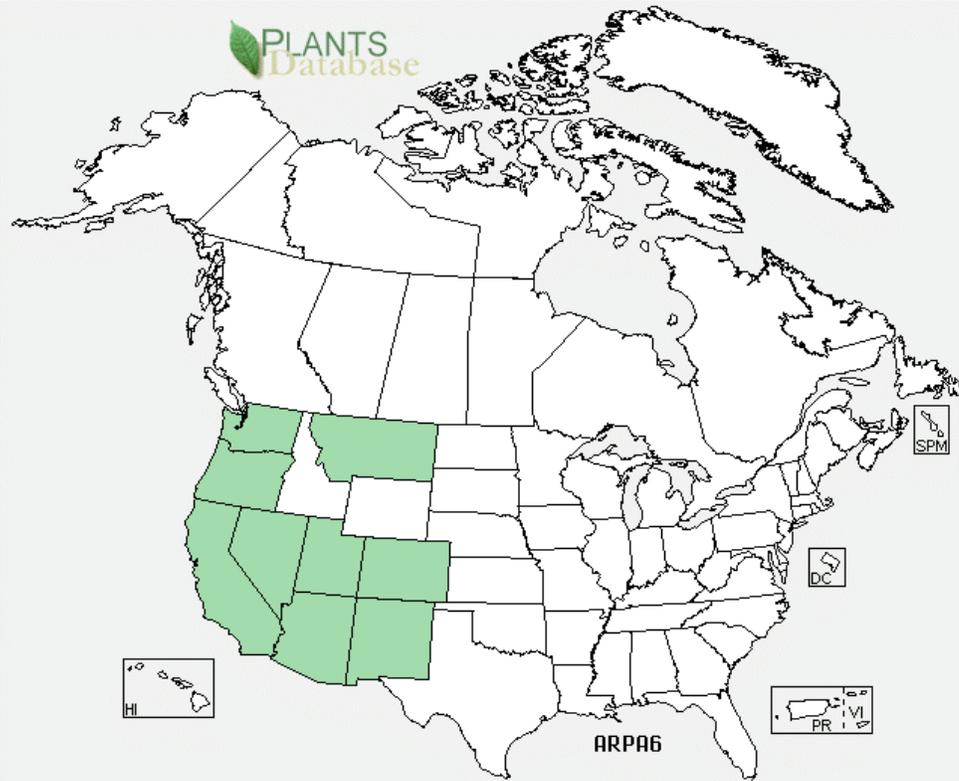
Image © 2005, Ben Legler

TAXONOMY	
Family Names	
Family Scientific Name:	<i>Ericaceae</i>
Family Common Name:	Heath
Scientific Names	
Genus:	<i>Arctostaphylos</i>
Species:	<i>patula</i>
Species Authority:	E. Greene
Variety:	The USDA database has all varieties as synonyms and not as distinct

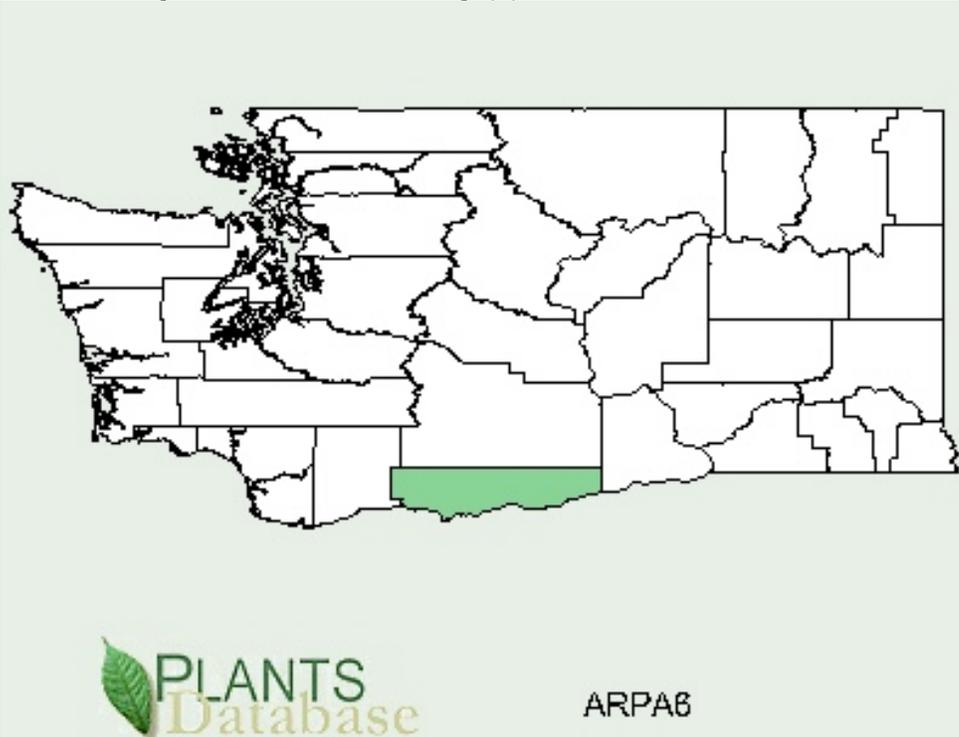
	varieties
Sub-species:	None (subspecies labeled as synonym by USDA)
Cultivar:	<i>Arctostaphylos patula</i> 'Altura' (3)
Authority for Variety/Sub-species:	None
Common Synonym(s) (include full scientific names (e.g., <i>Elymus glaucus</i> Buckley), including variety or subspecies information)	<i>Arctostaphylos acutifolia</i> Eastw. <i>Arctostaphylos parryana</i> Lemmon var. <i>pinetorum</i> (Rollins) Wies. & Schreib. <i>Arctostaphylos patula</i> Greene ssp. <i>platyphylla</i> (A. Gray) P.V. Wells <i>Arctostaphylos patula</i> Greene var. <i>coalescens</i> W. Knight (4)
Common Name(s):	Greenleaf Manzanita, Green leaf Manzanita, Snowbrush Manzanita
Species Code (as per USDA Plants database):	ARPA6 (4)
GENERAL INFORMATION	

Geographical range
(distribution maps
for North America
and Washington
state)

Washington, south into southern California, Nevada, Arizona, Utah, New Mexico, Colorado, and in the north Montana
(4)



Found locally in the Klickitat County (4)



Ecological distribution (ecosystems it occurs in, etc):	Open coniferous forests with dry, well-drained sandy loam to silty loam soils. Openings or gaps in mountain forest areas. (1)(2)(4)(5)
Climate and elevation range	Found from 950 to 3050 m in elevation. Does well in the Great Basin and the Sierra Nevada area. It grows naturally in Hardy to Zone 6
Local habitat and abundance	<i>A. patula</i> is often found to be associated with the following species: Douglas-fir, Ponderosa pine, Sitka Spruce, Lodgepole pine, Coastal Redwood, Western hardwoods, Chaparral, and Juniper (6) Its occurrence is considered common throughout its range. (5)
Plant strategy type / successional stage	The plant is a stress tolerator
Plant characteristics (life form (shrub, grass, forb), longevity, key characteristics, etc)	<i>A. patula</i> is a perennial shrub. It has taproots that can reach up to 2 and half meters deep. Some of the <i>A. patula</i> population in California has a basal burl adapted for regeneration after fire. The leaves are 7-15mm long with an ovate shape. It has a simple leaf that is palmately veined. The leaves are green. <i>A. patula</i> has mainly red fruit that droops and is about 1.5 cm in diameter The bark of the Manzanita is rough and can have short hairs and gold, but mature bark is smooth and bright red-brown. The Manzanita can grow to 2 meters tall and 3 meters wide. (2)(3)(5)(7)
PROPAGATION DETAILS	
Ecotype	<i>A. patula</i> grows on sandy, moist, deep soils that drain readily. The Manzanita naturally habitats areas of sun or semi sun, gaps and openings. In summer these readily drained soils should be dry. Manzanitas grown in the shade produce less fruit. (1) (2) (6) During the winter <i>A. patula</i> can survive as low as -10° C (10)
Propagation Goal:	Plant, out planted in native habitat
Propagation Method:	Seed is a viable option, though care must be taken in seed preparation. Cuttings are also viable and are the preferred method amongst horticulturalist as Manzanita can hybridize with local species, which will change the outcome of seeding (1)(3).
Product Type	Container (plug), out plant in late fall to early winter
Stock Type:	Mature adult
Time to Grow (from seeding until plants are ready to be outplanted):	1 year
Target Specifications	Stress tolerant plant
Propagule Collection (how, when, etc):	Seed: collect during late fruit development by hand or by picking fruit off the ground. In flower from March to May, and the seeds ripen from August to October. (1) (6) (3) Cutting: make cuttings in early spring between March and May (3). Put the cutting in a container (plug). To reduce water loss and encourage

	rooting, keep them in faint shade or in a cold bed (3). After the plant is established and growing in later spring the plant can be layered.
Propagule Processing/Propagule Characteristics:	Seeds can remain dormant in soil for greater than 100 years. There are several seeds with a thick endocarp per berry. The seed density calculated from 1 sampling had about 8,200 seeds per kilogram (1)
Pre-Planting Propagule Treatments:	<p>FROM SEED: The seeds must be scarified to break through the hard endocarp. This scarification can be done with Sulfuric Acid for 2-4 hours (1). The seed can be filed to break the endocarp without doing so over the embryo (3). The seeds can also be opened with fire; the seeds are spread on a metal flat with 3-4 inches of pine needles over top and set on fire (1). The heat will crack open the endocarp.</p> <p>It is best to do a trial with different times, temperatures, or fuel loads for each specific seed lot then test for viability. This is because the thinnest part of the endocarp is where the embryo sends the root through and this area can be damaged more readily by over-scarification (1).</p> <p>Once the seed is scarified: The seeds have a physiological dormancy to overcome and must be cold-moist stratified for 2-4 months at 2-5°c in moss (1) (2)</p> <p>FROM CUTTING: Cut in early spring with 5-7cm of last years woody growth. The same growth medium as seeding can be used but the cutting should be dipped in a root growth hormone (3). Cuttings are slow to start and may take up to a year to fully root (10).</p>
Growing Area:	1 part sand 1 part moss kept between 5.0-6.0 Ph (2)(3) the germinated seeds or cuttings can be kept in small containers till rooting occurs. Once plants have established, pot into gallon size containers then moved to final destination in late fall or early winter. Minimize root disturbance by transplanting as little as possible as <i>A.patula</i> is intolerant to it.
Establishment Phase (from seeding to germination):	If stratifying do so over winter and plant seeds in early spring.
Length of Establishment Phase:	2-4 months(1)(3)
Active Growth Phase (from germination until plants are no longer actively growing):	Early spring to late fall/ early winter. Early winter is when to transplant <i>A. patula</i> to avoid root disturbance as it will not be actively growing and will be somewhat prepared for the stress. (3) Water every day very lightly for first 15-30 days then slowly increase time intervals to up to 4 weeks between watering in late summer (2)(5).
Length of Active Growth Phase:	6-9 months (3)
Hardening Phase :	Late fall/early winter
Length of Hardening Phase:	Not specified
Harvesting, Storage and Shipping (of seedlings):	Harvest berries in later summer off ground or Manzanita. Transport seedlings in 1-gallon container during winter.

Length of Storage (of seedlings, between nursery and outplanting):	6-9 months
Guidelines for Outplanting / Performance on Typical Sites:	There should be no need to water outplantings in their native habitat, if plant appears stressed watering once every 4-6 weeks is recommended (3). For the urban environment organic nutrient rich soils and acidic fertilizers allow for seedlings and more specifically cuttings to thrive (5)(2).
Other Comments (including collection restrictions or guidelines, if available):	<i>A. patula</i> is susceptible to root rot and certain fungi. It is for this reason that watering should be kept to a minimum. When outplanting, ensure that the plant is at a higher soil elevation than surrounding soil to prevent crown rot (2)
INFORMATION SOURCES	
References (full citations):	<ol style="list-style-type: none"> 1. Schopmeyer, C. S. (Tech. Coord.). Seeds of woody plants in the United States. Forest Service, USDA. Agriculture Handbook No. 450. Pg 230-232 2. Carlson, J. R. and Sharp, W. C. (1975). Germination of high elevation Manzanita. Tree Plant. Notes 26(3), 10-11, 25. 3. USDA Plant guide to Greenleaf Manzanita: Contributed By: Santa Barbara Botanic Garden & USDA, NRCS, National Plant Data Center http://plants.usda.gov/plantguide/doc/pg_arpa6.doc 4. USDA Plant Database http://plants.usda.gov/java/profile?symbol=ARPA6 5. GardenGuides.com, Greenleaf Manzanita guide http://www.gardenguides.com/plants/plantguides/shrubs/plantguide.asp?symbol=ARPA6 6. Previous Plant Propagation Protocol, Doug Schmitt 2003. http://depts.washington.edu/propplnt/Plants/Arctostaphylos_patula.htm 7. University of Texas plant Database http://www.wildflower.org/plants/result.php?id_plant=arpa6 8. Native Plant Network Plant Propagation Protocol http://www.nativeplantnetwork.org/network/view.asp?protocol_id=1657 9. Burke museum archives http://biology.burke.washington.edu/herbarium/imagecollection.php?Genus=Arctostaphylos&Species=patula

	10. Plants for a future http://www.pfaf.org/database/plants.php?Arctostaphylos+patula
Protocol Author (First and last name):	Keith Stoner
Date Protocol Created or Updated (MM/DD/YY):	04/28/2009

Note: This template was modified by J.D. Bakker from that available at:
<http://www.nativeplantnetwork.org/network/SampleBlankForm.asp>