Plant Propagation Protocol for *Artostaphylos glandulosa*
ESRM 412 – Native Plant Production
URL: https://courses.washington.edu/esrm412/protocols/2023/*ARGL3*



Source: Calphotos & Calscape

Arctostaphylos glandulosa
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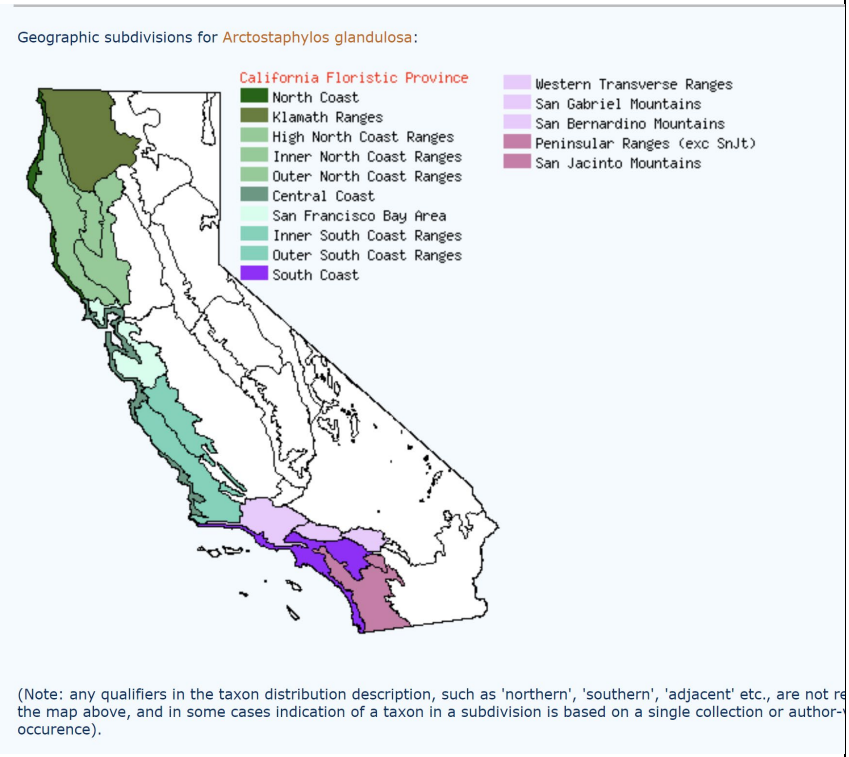
Source: Parker and Keeley (2012)

TAXONOMY	
Plant Family	
Scientific Name	Ericaceae
Common Name	Heath
Species Scientific Name	
Scientific Name	*Arctostaphylos glandulosa* Eastwood
Varieties	
Sub-species	*Arctostaphylos glandulosa* subsp. *adamsii* Munz, *Arctostaphylos glandulosa* subsp. *atumescens* J.T. Keeley, M.C. Vasey & V.T. Parker *Arctostaphylos glandulosa* subsp. *crassifolia* P.V. Wells *Arctostaphylos glandulosa* subsp. *erecta* J.T. Keeley, M.C. Vasey & V.T. Parker *Arctostaphylos glandulosa* subsp. *glandulosa*, (typical subspecies) *Arctostaphylos glandulosa* subsp. *glaucomollis* P.V. Wells *Arctostaphylos glandulosa* subsp. *leucophylla* J.T. Keeley, M.C. Vasey & V.T. Parker *Arctostaphylos glandulosa* subsp. *mollis* P.V. Wells *Arctostaphylos glandulosa* subsp. *zacaensis* P.V. Wells Source: Fryer (2020)
Cultivar	
Common Synonym(s)	For *Arctostaphylos glandulosa* subsp. *adamsii*: • *Arctostaphylos glandulosa* var. *adamsii* Munz For *Arctostaphylos glandulosa* subsp. *crassifolia*: • *Arctostaphylos glandulosa* var. *crassifolia* Jeps. For *Arctostaphylos glandulosa* subsp. *glandulosa*: • *Arctostaphylos glandulosa* subsp. *cushingiana* (Eastw.) Keeley, Vasey & Parker • *Arctostaphylos glandulosa* var. *cushingiana* (Eastw.) J.E. Adams ex McMinn • *Arctostaphylos glandulosa* subsp. *glandulosa* forma *cushingiana* (Eastw.) P. V. Wells • *Arctostaphylos intricata* Howell For *Arctostaphylos glandulosa* subsp. *mollis*: • *Arctostaphylos glandulosa* var. *mollis* J.E. Adams For *Arctostaphylos glandulosa* subsp. *zacaensis*: • *Arctostaphylos glandulosa* subsp. *howellii* (Eastw.) P.V. Wells • *Arctostaphylos glandulosa* var. *howellii* (Eastw.) J.E. Adams ex McMinn

	• *Arctostaphylos glandulosa* subsp. *zacaensis* forma *howellii* (Eastw.) Wells • *Arctostaphylos glandulosa* var. *zacaensis* (Eastw.) J.E. Adams ex McMinn Source: Fryer (2020)
Common Name(s)	Eastwood's Manzanita Adams' manzanita Del Mar manzanita Transverse Range manzanita Zaca manzanita Source: Fryer (2020)
Species Code	ARGL3

GENERAL INFORMATION	
Geographical range	Eastwood's manzanita has the widest geographic distribution of all manzanitas and can be found from central Oregon to Baja California Norte, Mexico.  Figure 1—Distribution of Eastwood's manzanita in the United States. Map courtesy of the U.S. Department of Agriculture, Natural Resources Conservation Service. [2020, June 11] [142]. See Plants Database for distributions of infrataxa. Source: Fryer (2020)

	 Source: Parker and Keeley (2012)
Ecological distribution	*Arctostaphylos glandulosa* is found within matorral vegetation association of California. Fryer (2020) reports that *A. glandulosa* 'grows primarily in chaparral but also in annual grasslands, oak scrub, oak and pine woodlands, and coniferous forests." Source: Fryer (2020); Calscape.
Climate and elevation range	Mediterranean climate; tolerant of mild winters (with January temperatures between 32º-59ºF and summer drought (10-30 inches of rain/year). Elevation range: 160 to 7,200 feet (50-2,200 m), depending on location and infrataxon. Source: Fryer (2020)
Local habitat and abundance	Rocky outcrops, slopes, and ridges within elevation range (see above). Calscape reports that A. glandulosa 'occurs in chaparral systems at lower elevations and in openings in evergreen forests at higher elevations.' Source: Calscape.
Plant strategy type / successional stage	Stress-tolerator/competitor.

	A. glandulosa is adapted to grow in a wide elevation, climate, and aspect range. It grows vegetatively following fire events and outcompetes other chapparal species by growing lateral roots in tight rock crevices that other species cannot colonize. It also grows adventitious roots at the surface of the soil profile. Seeds stored in the soil typically survive fire events and are adapted to germinate with exposure to leachate from charred wood. Source: Fryer (2020)
Plant characteristics	*A. glandulosa* is an upright or mound-forming shrub that grows from 3-10 feet tall. It sprouts multiple stems from a basal burl – sometimes growing genetically distinct branches if sprouting from an animal horde or a fused seed propagule. Branches and stems grow in a crooked form, often bearing ribbons of dead or old wood. Stems, leaves, flowers, and fruits are sticky. Roots can extend more than 17' deep on sites with amenable soil profiles, or into tight rock crevices. See above. Specimens flower in later winter-early spring, and set seed in later summer- early fall depending on their location. Flower and seed production varies depending on the number of flower buds initiated in the previous year. Intertaxon variation makes it difficult to determine seed setting behavior, with some populations exhibiting obligate seeding behaviors while others behave like sprouting chaparral species. Seeds of this species are physiologically and morphologically dormant at maturity, and typically break dormancy following fire events, acid scarification through animal digestion, and overwintering. Fire events top-kill *A. glandulosa*, but mature specimens will sprout vegetatively from their basal burls. Source: Fryer (2020)

PROPAGATION DETAILS

Due to limited information, *A. glandulosa* protocol is supplemented with additional information from Herrera and Takara's (2006) protocol for *Arctostaphylos catalinae* P.V. Wells.

Ecotype	no information given.
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Container (plug)
Stock Type	
Time to Grow	Variable – see pre-planting propagule treatments
Target Specifications	Well balanced plants with firm root plug in container.
Propagule Collection Instructions	Seeds ripen from late summer to early fall, depending on the location. Hand collect fruits when matured (late summer to November) Source: Fryer (2020); Herrera and Takara (2006)
Propagule Processing/Propagule Characteristics	Dry fruits by storing in paper bags in a warm dry room. Fruits can be rehydrated in water for 24 hours prior to cleaning. Clean and separate seeds by macerating dry fruits in modified blender. Remove fine debris by sifting and using a blower to remove additional debris. Group nutlets and stone pieces into similar sized pieces if using acid scarification. Source: Fryer (2020); Herrera and Takara (2006)
Pre-Planting Propagule Treatments	Seed germination is difficult due to physical and physiological dormancy of manzanita seeds. Germination can increase as much as 5% with exposure to charred wood or aqueous extracts or leachates from charred wood, with additional increases in germination if charring/acid treatment is followed with cold stratification (Baskin and Baskin, 1998; Baskin and Baskin, 2002). *Fire Treatment:* Sow seeds into slightly moist but unwatered germination medium in mid-late October. Use a deep, fire-proof container (e.g. metal or wood with aluminum foil covering edges exposed above soil). Cover seeds and medium with a 4-6 inch thick layer of pine needles or excelsior. Ignite the pine needles with a couple of pieces of wadded paper. Let flash fire consume pine needles fuel and self-extinguish.

	Acid Scarification: Soak in concentrated H 2 S04 for 4-15 hours – treating nutlets and stone pieces separately as size of material determines treatment times. Sow treated seeds into a nursery flat containing a moistened germination medium. Leave seeded, acid-or fire-treated container outdoors to allow winter diurnal temperatures and precipitation to further break dormancy. Source: Emery (1998)
Growing Area Preparation / Annual Practices for Perennial Crops	Use nursery flat filled with 4:1:1 peat: perlite: compost germination to treat, sow, and stratify seeds. Source: Emery (1998); Herrera and Takara, (2006)
Establishment Phase Details	Pre-treated seeds sown in mid-late October tend to germinate within two months. If they do not germinate by June, allow the growing media to dry out during the summer and cold-stratify over a second fall and winter period. Additional germination may occur in the second Spring after sowing. Source: Emery (1998)
Length of Establishment Phase	2-15 months.
Active Growth Phase	Transplant established seedlings that have at least 2 true leaves into containers filled with a 4:1:1 growing medium of peat, perlite, and organic compost. Incorporate organic fertilizer blend into media at rate of 3lbs NatureTech fertilizer, 1lb blood meal, 0.5lbs Calpril, and 0.5 lbs Dolopril per 2lbs of medium. Source: Herrera and Takara (2006)
Length of Active Growth Phase	no information
Hardening Phase	Shade grown nursery stock is hardened through sun exposure for 2-4 weeks prior to outplanting. Source: Herrera and Takara (2006)
Length of Hardening Phase	2-4 weeks. Source: Herrera and Takara (2006)
Harvesting, Storage and Shipping	Containerized seedlings are over wintered directly in open growing compound. Source: Herrera and Takara (2006)
Length of Storage	Variable – depends on outplanting date.
Guidelines for Outplanting /	Ideal outplanting season runs from November to mid-March when moisture is available.

Performance on Typical Sites	Source: Herrera and Takara (2006)
Other Comments	Three *A. glandulosa* infrataxa have state protection status in California: Del Mar Manzanita, Arctostaphylos glandulosa subsp. glaucomollis, and Transverse Range manzanita. Del Mar and *A. glandulosa subsp. glaucomollis* have considered imperiled (T2) species while the Transverse Range is ranked as vulnerable (T3). *Source: Fryer (2020)*

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