

Plant Propagation Protocol for *Astragalus purshii*

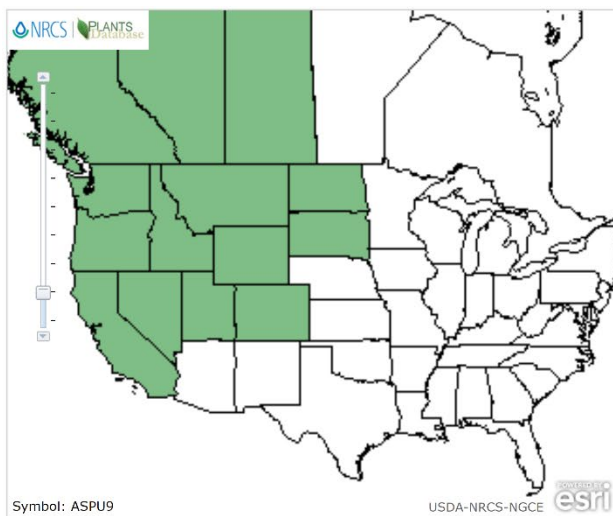
ESRM 412 – Native Plant Production

URL: <https://courses.washington.edu/esrm412/protocols/2021/ASPU9.pdf>

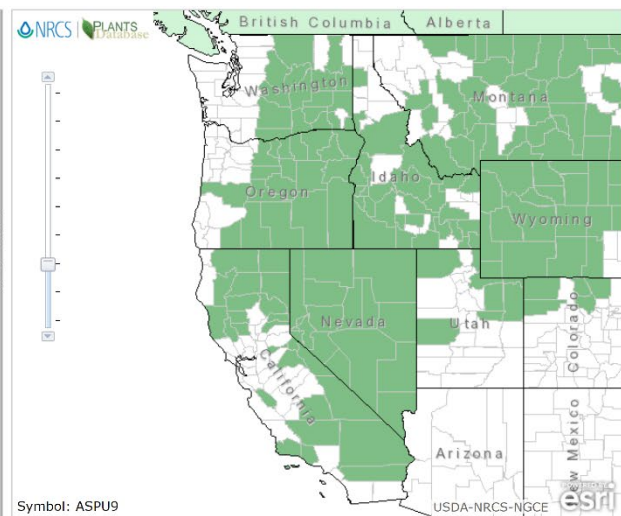


Credit: Left – Ben Legler, Right – Ron Bockelman⁵

North America Distribution



Pacific Northwest Distribution



Source: USDA PLANTS Database¹⁰

TAXONOMY	
Plant Family	
Scientific Name	Fabaceae
Common Name	Pea Family
Species Scientific Name	
Scientific Name	<i>Astragalus purshii</i> Douglas ex Hook.
Varieties	<i>Astragalus purshii</i> var. <i>concinus</i> Barneby <i>Astragalus purshii</i> var. <i>glareosus</i> (Douglas ex Hook.) Barneby <i>Astragalus purshii</i> var. <i>lagopinus</i> (Rydb.) Barneby <i>Astragalus purshii</i> var. <i>lectulus</i> (S. Watson) M.E. Jones <i>Astragalus purshii</i> var. <i>ophiogenes</i> (Barneby) Barneby <i>Astragalus purshii</i> var. <i>pumilio</i> Barneby <i>Astragalus purshii</i> Douglas ex. Hook var. <i>purshii</i> <i>Astragalus purshii</i> var. <i>interior</i> M.E. Jones <i>Astragalus purshii</i> var. <i>tinctus</i> M.E. Jones <i>Astragalus purshii</i> var. <i>longilobus</i> M.E. Jones ¹⁰
Sub-species	None in USDA PLANTS Database
Cultivar	None found – not often cultivated or propagated
Common Synonym(s)	None found, although synonyms for varieties exist ¹¹
Common Name(s)	Pursh's milk-vetch, woolly-pod milk-vetch ⁵ , woolly-pod locoweed ⁹ , Pursh's sheeppod ²
Species Code (as per USDA Plants database)	ASPU9 ¹⁰
GENERAL INFORMATION	
Geographical range	maps above for distribution in North America and Washington state.
Ecological distribution	Prairies, sagebrush steppe and ponderosa forest ⁴
Climate and elevation range	Thrives in dry, sunny regions – <10 to 20” annual precipitation ^{9,10} . Elevation range not found.
Local habitat and abundance	Rocky soils (lithosols). May be found among <i>Artemisia rigida</i> , <i>Balsamorhiza rosea</i> , <i>Erigeron poliospermus</i> , <i>Lewisia rediviva</i> , <i>Poa secunda</i> , etc. ⁹
Plant strategy type / successional stage	Prevalent in community, including in late successions ⁹ .
Plant characteristics	Perennial herbaceous, spreading, low ⁹ - usually less than 7” tall ¹⁰ . Small pinnately compound leaves, somewhat woolly ⁶ . Colorful pea-like flowers, usually purple ⁹ . Fruit is a beaked ⁴ legume pod with dense white hairs ⁹ . Medium length life. Nitrogen fixer ¹⁰ .
PROPAGATION DETAILS*	
Gathering and Processing of Seed as Detailed by Barner¹ and Pickett⁷	

Ecotype	Barner and Pickett did not provide this.
Propagation Goal	seeds
Propagation Method	seed
Product Type	Propagules (seeds, cuttings, poles, etc.)
Stock Type	N/A
Time to Grow	N/A
Target Specifications	N/A
Propagule Collection Instructions	Pods grow close to the ground – collect by hand into cloth bags. They are fully mature in late April ³ .
Propagule Processing/Propagule Characteristics	Use a hammer-mill with a 4.75 mm (3/16 in) screen to separate the seeds from the pods. Then, process seed through a cleaner. A multi-deck cleaner with 2.75 mm top screen and 1.4 mm bottom screen with light wind could be used to remove dust and chaff ⁷ . Another option is a laboratory brush machine (Westrup Model LA-H), “with a #18 mantel, at medium speed”, and then an air column separator (Oregon Seed Blower) for “cleaning and separation” ¹ . There are approximately 176,500 to 201,000 seeds per pound. Purity: 98%, X-Ray 100 Seeds: 96% Filled ⁷
Pre-Planting Propagule Treatments	N/A
Growing Area Preparation / Annual Practices for Perennial Crops	N/A
Establishment Phase Details	N/A
Length of Establishment Phase	N/A
Active Growth Phase	N/A
Length of Active Growth Phase	N/A
Hardening Phase	N/A
Length of Hardening Phase	N/A
Harvesting, Storage and Shipping	N/A
Length of Storage	N/A
Guidelines for Outplanting / Performance on Typical Sites	Barner and Pickett did not provide this.
Other Comments	Barner and Pickett did not provide this.
Propagation of <i>Astragalus arrectus</i>** from Seed to Plants in Container (plug) as Detailed by Skinner⁸	
Ecotype	Skinner did not provide this.
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Container (plug)
Stock Type	10 cu. in. conetainer
Time to Grow	4 months
Target Specifications	Tight root plug in container
Propagule Collection Instructions	See previous information from Barner and Pickett

Propagule Processing/Propagule Characteristics	See previous information from Barner and Pickett
Pre-Planting Propagule Treatments	The seed coat restricts water uptake; germination is increased by scarification. Hot water scarification increases germination by 20% and manual (with sandpaper) increases germination by 35%. Inoculate with the proper Rhizobium species before planting.
Growing Area Preparation / Annual Practices for Perennial Crops	Seed is sown in 10 cu. in. Ray Leach Super cell conetainers filled with Sunshine #4.
Establishment Phase Details	Sow seed in greenhouse in January. Retain space between soil and top of container to allow deep watering. Apply a thin layer of pea gravel to prevent seeds from floating. Water deeply. Keep medium moist until germination. Some seed germinates in 7-8 days, most germinate in 2-3 weeks. A few seeds germinate a month or more after sowing.
Length of Establishment Phase	3 weeks
Active Growth Phase	Water plants deeply every other day and fertilize once per week with a complete, water soluble fertilizer containing micro-nutrients.
Length of Active Growth Phase	3 months
Hardening Phase	Move plants to cold frame in April if temperatures are warm enough to support it. Water every other day if the weather is cool, and every day during hot, dry weather.
Length of Hardening Phase	2 weeks
Harvesting, Storage and Shipping	Skinner did not provide this.
Length of Storage	Skinner did not provide this.
Guidelines for Outplanting / Performance on Typical Sites	Skinner did not provide this.
Other Comments	Skinner did not provide this.
INFORMATION SOURCES	
References	See below.
Other Sources Consulted	See below.
Protocol Author	Miguel Orr
Date Protocol Created or Updated	05/26/21

*The ‘Propagation Details’ section draws heavily from the work of the writer of another protocol, as indicated at the top of the section. Information in each of these sections is edited slightly for cohesion. Information provided by others is indicated by a citation.

**Due to a lack of propagation information on *Astragalus purshii*, I’ve chosen to include information about propagation of another *Astragalus* species, *Astragalus arrectus*. This species occurs in similar habitats to *Astragalus purshii* but can tolerate wetter conditions and is a somewhat larger plant¹², so applicability of this information may vary.

References:

- ¹Barner, Jim. *Propagation protocol for production of Propagules (seeds, cuttings, poles, etc.) Astragalus purshii Dougl. ex Hook. seeds*. 2007. USDA FS - R6 Bend Seed Extractory. 2021 May 14.
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- ²California Native Plant Link Exchange. *Astragalus purshii - Pursh's sheeppod* . n.d. 14 May 2021. <<http://www.cnplx.info/nplx/nplx?page=mdetail&taxon=Astragalus+purshii>>.
- ³Combs, J.K., Lambert, A.M. and Reichard, S.H. "Predispersal seed predation is higher in a rare species than in its widespread sympatric congeners (Astragalus, Fabaceae)." *American Journal of Botany* 100.11 (2013): 2149-2157. <<https://doi.org/10.3732/ajb.1300238>>.
- ⁴Hitchcock, C. Leo and Arthur Cronquist. *Flora of the Pacific Northwest: an illustrated manual*. 2nd. Seattle: University of Washington Press, 2018.
- ⁵Knoke, Don and David Giblin. *Astragalus purshii*. n.d. 12 May 2021.
<<https://biology.burke.washington.edu/herbarium/imagecollection/taxon.php?Taxon=Astragalus%20purshii>>.
- ⁶Montana Natural Heritage Program. *Woollypod Milkvetch - Astragalus purshii var. concinnus*. n.d. 13 May 2021. <<http://fieldguide.mt.gov/speciesDetail.aspx?elcode=PDFAB0F7A8>>.
- ⁷Pickett, Terron. *Propagation protocol for production of Propagules (seeds, cuttings, poles, etc.) Astragalus purshii Douglas ex Hook.* 2018. USDA NRCS - Aberdeen Plant Materials Center. 14 May 2021.
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- ⁸Skinner, David M. *Propagation protocol for production of Container (plug) Astragalus arrectus Gray plants*. 2005. 22 May 2021.
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- ¹⁰USDA NRCS National Plant Data Team. *Astragalus purshii Douglas ex Hook.* n.d. 12 May 2021. <<https://plants.sc.egov.usda.gov/home/plantProfile?symbol=ASPU9>>.
- ¹¹USDA PLANTS Database. Home/Basic Search Results. n.d. 22 May 2021.
<<https://plants.usda.gov/home/basicSearchResults?resultId=867dc594-5c02-4b1a-8784-d0415e15ebdd>>.
- ¹²Washington State Department of Natural Resources. "Astragalus arrectus A. Gray." n.d. 22 May 2021. <https://www.dnr.wa.gov/publications/amp_nh_asar7.pdf>.

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