Plant Propagation Protocol for *Astragalus alpinus*
ESRM 412 – Native Plant Production
URL: https://courses.washington.edu/esrm412/protocols/*2024/[ASAL7.pdf]*

Astragalus alpinus
Alpine Milkvetch
(Credit: Jörg Hempel)

TAXONOMY	
Plant Family	
Scientific Name	Fabaceae
Common Name	Pea Family
Species Scientific Name	
Scientific Name	*Astragalus alpinus* L.
Varieties	*alpinus* *brunetianus*
Sub-species	*arcticus* *alaskanus*
Cultivar	None. Plant is mostly found in its natural habitat.
Common Synonym(s)	Astragale alpin (FR)
Common Name(s)	Alpine milkvetch (EN)
Species Code (as per USDA Plants database)	ASAL7
GENERAL INFORMATION	

Geographical range	 (3)
Ecological distribution	Mountainous meadows (typically not above timberline) (2)
Climate and elevation range	Climate: **alpine & subalpine** (8) Elevation: **0 – 3400 m** (2)
Local habitat and abundance	Part shade, sun; gravelly or sandy cool lakeshores, ponds, creeks, meadows
Plant strategy type / successional stage	Early seral colonizer (1)
Plant characteristics	Group: **dicot** Habit: **forb/herb** Life cycle: **perennial** Height: **8 – 12 in** Root type: **tap** **Alternate** leaf arrangement **Simple** leaf complexity **Elliptic** leaf shape **Raceme** inflorescence Fruit type: **Legume** Bloom colors: **White**, **pink**, **blue**, **purple** Bloom time: **May**, **Jun**, **Jul**, **Aug** (6)
PROPAGATION DETAILS*	
Ecotype	No data
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Container (plug)
Stock Type	No data
Time to Grow	No data
Target Specifications	8 – 12 inches in height (6)
Propagule Collection Instructions	Seeds are produced from August to early September; seed collection possible during this time Seeds may be sown in spring Upland soil (1)
Propagule Processing/Propagule Characteristics	No data

Pre-Planting Propagule Treatments	Clean seeds with water, dry, then store in bag (if desired) prior to sowing May require scarification (1)
Growing Area Preparation / Annual Practices for Perennial Crops	Soil: **upland**, **dry mixture** (1)
Establishment Phase Details	Requires full sun and moist soil (1)
Length of Establishment Phase	No data
Active Growth Phase	No data
Length of Active Growth Phase	No data
Hardening Phase	No data
Length of Hardening Phase	No data
Harvesting, Storage and Shipping	No data
Length of Storage	No data
Guidelines for Outplanting / Performance on Typical	Transplant survivorship: 57% - 73% (1)
Other Comments	Endangered species
PROPAGATION OF *Astragalus utahensis***	
Ecotype	27 sources collected form Utah and Nevada at elevations between 4060ft and 7400 ft (9)
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Container (plug)
Stock Type	7.5 cu.in. QPlug
Time to Grow	16 weeks
Target Specifications	8 – 12 inches in height (6)
Propagule Collection Instructions	Hand collection of seeds necessary from wildland stands. As pods dry one end splits open releasing seed. Harvesting most populations from mid-June to mid-July results in little shattering loss. Later harvests are possible as seed loss increases. Collected pods are placed in breathable bags until cleaned. Retained moisture in pods is typically not high enough to result in seed spoilage if the pods don't dry after collection. Best practice: air dry seeds on a tarp until pods are brittle, then re-bag for storage until cleaning. (9)

Propagule Processing/Propagule Characteristics	Dry pods are run through debearder. Cleanout door is left partially open to allow separated seed to drop free of the hammers. Pods are processed until shattered. Final cleaning is performed on an air screen separator. Biggest contaminant is gravel; practicing care during collection will minimize this. Purity percentage can be in the upper 90s. Pods usually contain 30 ovules but ripen 8=9 seeds. Hard seeds store well at warehouse temps. (9)
Pre-Planting Propagule Treatments	Astragalus seeds have both a hard seed coat and physiological dormancy. Seed coat requires scarification. Nicking with a razorblade, sanding, drum scarifying, and acid treatments are all effective methods. Preferred method: 20-minute soak in sulfuric acid followed by consecutive water rinses to remove all acid residue. Physiological dormancy is broken by moist cold stratification. (9)
Growing Area Preparation / Annual Practices for Perennial Crops	With the use of conventional potting media and containers, Astragalus plants form thin root systems that fail to hold potting media when transplanted. A Q Plug fixes this issue. (9)
Establishment Phase Details	Q Plugs should be watered heavily several times prior to planting to ensure complete saturation. Unsaturated plugs dry quickly at the surface, slowing germination. Once saturated, plugs usually require less frequent watering than potting media. Greenhouse temps: 55 ºF night, 65 ºF day (9)
Length of Establishment Phase	Germination occurs over several weeks (9)
Active Growth Phase	Beginning at 4 weeks, plants are fertilized using a 15:15:15 N, P, K liquid drench biweekly (9)
Length of Active Growth Phase	12+ weeks (9)
Hardening Phase	None
Length of Hardening Phase	N/A
Harvesting, Storage and Shipping	Air dry seeds on tarp and store in bag (9)
Length of Storage	
Guidelines for Outplanting / Performance on Typical	Transplant survivorship: 57% - 73% (1)
Other Comments	N/A

INFORMATION SOURCES	
References	1. Anderson, Michelle D. 2007. Astragalus alpinus. In: Fire Effects Information System. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). https://www.fs.usda.gov/database/feis/plants/forb/astalp/all.html. Accessed 9 May 2024. 2. "Astragalus alpinus (Alpine Milkvetch)." Minnesota Wildflowers. https://www.minnesotawildflowers.info/flower/alpine-milkvetch. Accessed 9 May 2024. 3. "Astragalus alpinus L." United States Department of Agriculture. https://plants.usda.gov/home/plantProfile?symbol=asal7. Accessed 9 May 2024. 4. Fertig, Walter. "Plant of the Week: Alpine Milkvetch (Astragalus alpinus)." United States Department of Agriculture. https://www.fs.usda.gov/wildflowers/plant-of-the-week/astragalus_alpinus.shtml. Accessed 9 May 2024. 5. Hunt, Peggy. Jaime, Wharton. "Norton Sound Germplasm alpine milkvetch." Alaska Dept. of Natural Resources. 13 August 2008. https://dnr.alaska.gov/ag/akpmc/pdf/plant-flyers/NortonSoundGermplasmalpinemilkvetch.pdf. Accessed 9 May 2024. 6. TWC Staff. "Plant Database: Astragalus alpinus." Lady Bird Johnson Wildflower Center – The University of Texas at Austin. 15 December 2013. https://www.wildflower.org/plants/result.php?id_plant=asal7. Accessed 9 May 2024. 7. Luna, Tara. Dedekam, Sara. Protocol Information for: Juncus (balticus). Reforestation, Nurseries, & Genetic Resources. https://rngr.net/npn/propagation/protocols/juncaceae-juncus-2911. Accessed 13 May 2024. 8. "Alpine Milkvetch (*Astragalus alpinus*)." iNaturalist. https://www.inaturalist.org/taxa/130478-Astragalus-alpinus. Accessed 13 May 2024. 9. Jensen, Scott. "Protocol Information for: Astragalus (utahensis)." Native Plant Network. https://npn.rngr.net. Accessed 13 May 2024.
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*Very limited information is available regarding propagation specifics of *Astragalus alpinus* due to its rarity. ***Astragalus utahnesis* is a similar species to *Astragalus alpinus* in that it prefers the same living conditions (e.g. sunlight, soil composition, elevation, etc.), so I have chosen to provide protocol details for this species in an attempt to fill in the gaps observed in the protocol details for *Astragalus alpinus*.	