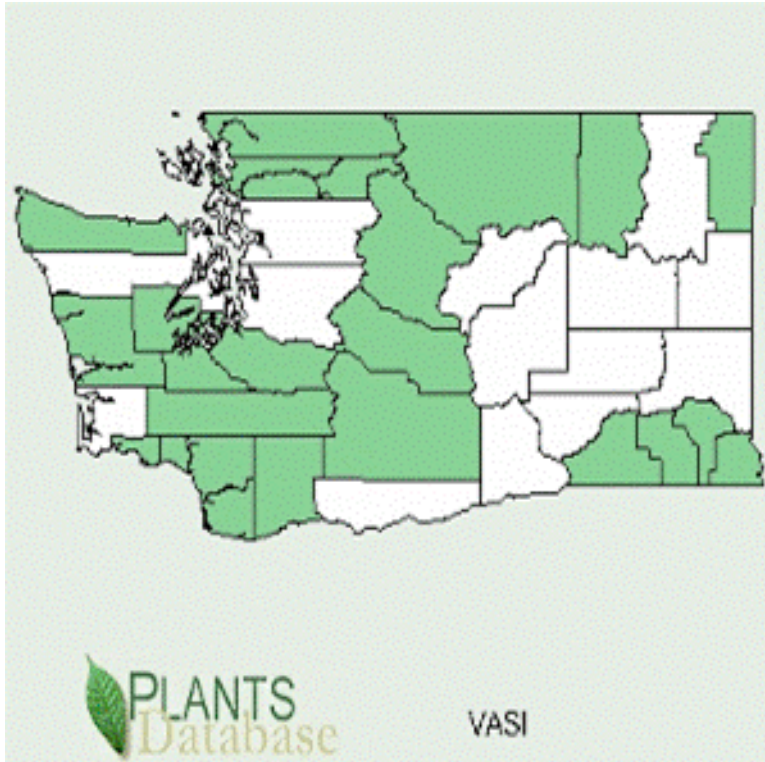


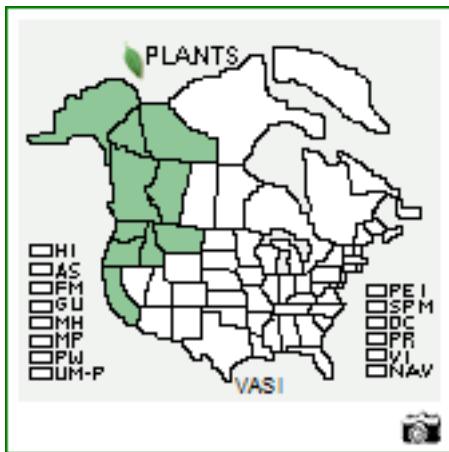
Plant Propagation Protocol for *Valeriana sitchensis*

ESRM 412 – Native Plant Production

Protocol URL: <https://courses.washington.edu/esrm412/protocols/VASI.pdf>



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TAXONOMY	
Plant Family	
Scientific Name ¹	<i>Valerianaceae</i>
Common Name ¹	Valerian
Species Scientific Name	
Scientific Name ¹	<i>Valeriana sitchensis</i> Bong.
Varieties	None
Sub-species ¹	<i>Valeriana sitchensis</i> subsp. <i>sitchensis</i> <i>Valeriana sitchensis</i> subsp. <i>scouleri</i> <i>Valeriana sitchensis</i> subsp. <i>uliginosa</i>
Cultivar	None
Common Synonym(s) ²	<i>Valeriana sitchensis</i> Bong. var. <i>hookeri</i> <i>Valeriana sitchensis</i> Bong. var. <i>sitchensis</i>

Common Name(s) ^{1,3}	Sitka Valerian, Mountain Heliotrope
Species Code (as per USDA Plants database) ⁷	VASI
GENERAL INFORMATION	
Geographical range ^{1,2,7}	Western U.S. including Alaska, Washington, Idaho, Oregon, Montana and California
Ecological distribution ^{1,2,4}	-Moist mid to high elevations in the Cascade Range and other mountain areas -Subalpine meadows -Stream banks
Climate and elevation range ⁴	Mid-high elevations ~ 2,032 m
Local habitat and abundance ^{1,4}	Mt. Rainier National Park, Tipsoo Lake area, Cascades -Abundant
Plant strategy type / successional stage ^{2,5,7}	-Fibrous-rooted forb with a rhizome stem base -Wind dispersed seed -Competitor -Can reproduce vegetatively
Plant characteristics ^{2,5,7}	-Perennial forb, 30-120 cm tall -Leaves opposite and divided into 3-7 coarsely toothed leaflets -Fruit is 3-6 mm, oblong and topped with a feathery plume -Flowers are white to pale pink, 4-7 mm long; petals are fused into 5-lobed tube with stamens protruding
PROPAGATION DETAILS	
Propagation Goal ^{1,3}	Plants
Propagation Method ^{1,3}	Seed
Product Type ^{1,6}	Container (plug)
Stock Type ¹	1-year containers
Time to Grow ^{1,4}	8 months-1 year
Target Specifications ^{1,4}	A well-developed rhizome with a healthy fibrous root system that supports a healthy crown of basal foliage
Propagule Collection Instructions ¹	-Seeds are ripe and ready to be collected when “plumules” are beginning to unfurl -Seeds shatter and are easily harvested once “pumules” have opened
Propagule Processing/Propagule Characteristics ^{1,3,4}	-Air-dry seed on an open bench top in a warm room or greenhouse -Once seed “plumules” are dry they can be easily rubbed off -Dried seed weight= 448,000 seeds/lb.
Pre-Planting Propagule Treatments ^{1,4}	-Cold, moist stratification needed -Seeds should be cleaned using a hammer mill

	<ul style="list-style-type: none"> -Start by sowing into standard “1020” flats in appropriate soil -Water and place into plastic bags in a 35 degree Fahrenheit cooler -Keep in cooler for at least 13 weeks, which results in 4% germination -5 month stratification resulted in 50% germination
Growing Area Preparation / Annual Practices for Perennial Crops ¹	<ul style="list-style-type: none"> -When ready for transplant, seedlings should be potted in 4” square pots in an organic soil mix to provide richer, denser soil to hold in higher amounts of moisture
Establishment Phase Details ^{1,4,6}	<ul style="list-style-type: none"> -Use low fertilizer rates -Keep in “1020” flats
Length of Establishment Phase ¹	3 months
Active Growth Phase ¹	<ul style="list-style-type: none"> -Seedlings grow slowly for the first season, using low rates of fertilizer -Increased soil moisture and well-drained soils allow fibrous root development -Plants should be moved to shadehouse in July when top growth begins to take off
Length of Active Growth Phase ^{1,6}	May-August 3-4 months
Hardening Phase ^{1,4}	<ul style="list-style-type: none"> -Fertilizer treatment is ended in July -Shade cloth is removed at the end of August to allow for full sun acclimation -Irrigation is gradually reduced in September and October -Plants not out-planted in the first year are hardened off
Length of Hardening Phase ^{1,4}	August-September 1-2 months
Harvesting, Storage and Shipping ¹	<ul style="list-style-type: none"> -Plants shipped in containers in early Fall for out-planting -Over wintered plants require re-potting into 6” or 1 gallon cans by Spring
Length of Storage ⁴	5 months
Guidelines for Outplanting / Performance on Typical Sites ^{1,4}	<ul style="list-style-type: none"> -Crowns should be carefully placed and settled at soil level -Out-planting date: August
Other Comments ¹	<ul style="list-style-type: none"> -Vegetative propagation by cutting large rhizomes with several growing crown points has been successful -Handlers may find pungent odor unpleasant
INFORMATION SOURCES	
References	<p>1- USDA, NRCS Protocol Information, Corvallis Plant Materials Center. Corvallis, Oregon. www.nrcs.usda.gov/ Accessed May 15, 2015.</p> <p>2- Burke Museum of Natural History and Culture, WTU Herbarium Image Collection. 2015. Web.</p>

	<p>www.biology.burke.washington.edu/herbarium Accessed May 15, 2015.</p> <p>3- USDA Germplasm Resources Information Network (GRIN), Taxonomy for Plants. Web. www.ars-grin.gov/ Accessed May 15, 2015.</p> <p>4- Native Plant Network, Native Plant Nursery USDI NPS- Glacier National Park, MT. Protocol Information. Web. www.nativeplantnetwork.org/network/ViewProtocols Accessed May 15, 2015.</p> <p>5-Pojar, J. and A. MacKinnon. 1994. Plants of the Pacific Northwest Coast. Lone Pine Publishing. Page 333.</p> <p>6- Hitchcock, C.L. and A. Cronquist. 1973. Flora of the Pacific Northwest. University of Washington Press, Seattle, WA.</p> <p>7- USDA- Plants Database. Web. www.plants.usda.gov/core/profile?symbol=VASI Accessed May 15, 2015.</p>
Other Sources Consulted	
Protocol Author	Allison Burdick
Date Protocol Created or Updated	05/20/15

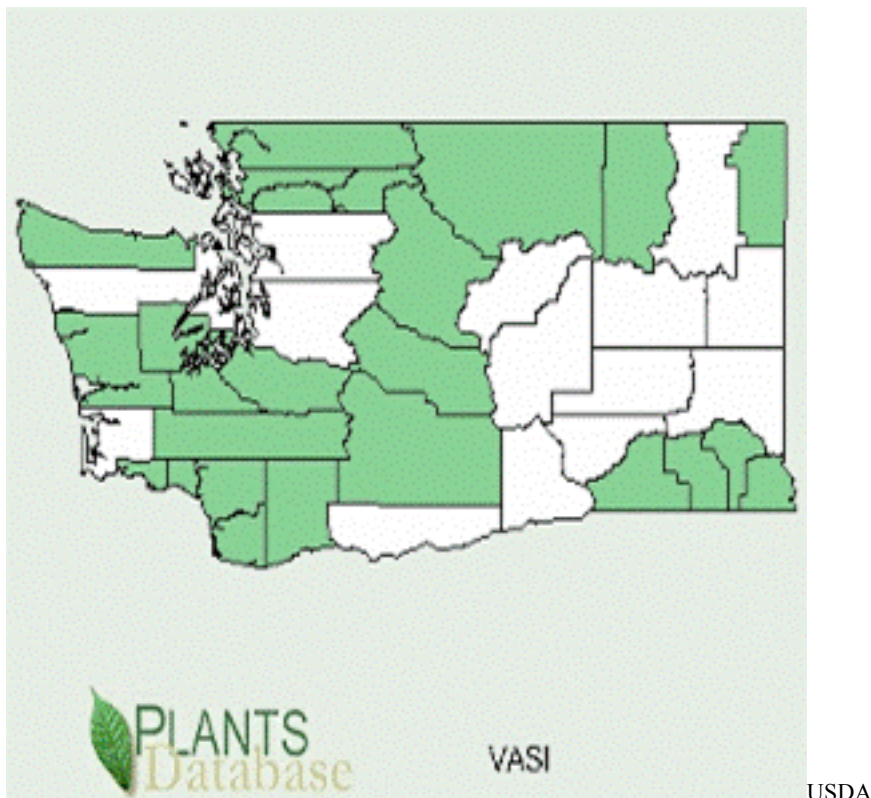
(2006 *Valeriana sitchensis* Profile ESRM 412- Maura Shelton)

Species: *Valeriana sitchensis*, Sitka Valerian, Mountain Heliotrope

Range: Coastal areas from Alaska to California; Olympic and Cascade Mountains

Climate, elevation: 1464-6080 meters, sub-alpine

Local occurrence: State of Washington



Habitat preferences: Moist ground on wooded slopes or meadows, sub-alpine, full Sun to partial shade. May become dwarf under extreme cold conditions, in young plants it has a pink or redness which is anthocyanin, a pigment that protects the plant from UV rays and also absorbs and concentrates infrared, heating the plant.

Plant strategy type: Early to late succesional in meadow communities.

Associated species: *Valeriana acutiloba*

May be collected as: seed, allow pods to dry on plant; break open to collect seeds

Collection restrictions or guidelines:

- Seeds are hand collected in mid September when achenes are turn tan and are easily separated from the receptacle. Seeds can be cleaned using a hammermill.
- Ripe seeds collected generally when pappus-like "plumules" or plumose calyx appendages, are beginning to unfurl are best: seeds shatter and blow away easily once these have opened. However if collected too early you can find incomplete seed fill.

Seed germination: Seed - sow spring in a cold frame and only just cover the seed because it requires light for germination. Cold moist stratification is needed for this species. *5 month outdoor cold moist stratification

Seed life: Seed longevity is unknown

Recommended seed storage conditions; Dry, seed dormancy is classified as physiological dormancy

Propagation recommendations: Seeds preferred, but limited vegetative propagation, by cutting large rhizomes with several growing crown points, was also successful for this species although seed propagation was preferred to avoid the need for digging up rhizomes from their native sites

Propagation Methods:

From seed, direct sow outdoors in fall

If sowing indoors, stratify, winter sow in vented containers, coldframe or unheated greenhouse

Soil or medium requirements:

Soil pH requirements:

6.1 to 6.5 (mildly acidic)

6.6 to 7.5 (neutral)

7.6 to 7.8 (mildly alkaline)

Installation form (form, potential for successful outcomes, cost): Place seedlings into individual pots when they are large enough to handle and plant out into their permanent positions in the summer if sufficient growth has been made. If the plants are too small to plant out, grow them on in the greenhouse or frame for their first winter and plant them out early in the following summer. Division in spring. Larger divisions can be planted out direct into their permanent positions. Pot smaller divisions and grow them on in light shade in a greenhouse or cold frame until they are growing well. Plant them out in the summer or the following spring.

Recommended planting density:

Spacing:

18-24 in. (45-60 cm)

Care requirements after installed : medium moisture requirements

Normal rate of growth or spread; lifespan: establishment phase 3 months, active growth phase May - August

Sources cited:

1. Dave's Garden <http://davesgarden.com/pf/go/67824/index.html>

2. Hitchcock, C.L. and A. Cronquist 1973 Flora of the Pacific Northwest. University of Washington Press, Seattle Wa

3. Mathews, Daniel. Cascade-Olympic Natural History. 1988

4. USDA Natural Resources Conservation District,
http://nativeplants.for.uidaho.edu/network/view.asp?protocol_id=2642

5. Wick, Dale; Evans, Jeff; Luna, Tara. 2001. Propagation protocol for production of container *Valeriana sitchensis* Bong. plants (172 ml containers); Glacier National Park, West Glacier, Montana. In: Native Plant Network. URL: <http://www.nativeplantnetwork.org> (accessed 27 April 2006). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery

Data compiled by: Maura Shelton, April 27, 2006