

## Plant Propagation Protocol for *Heuchera cylindrica*

ESRM 412 – Native Plant Production

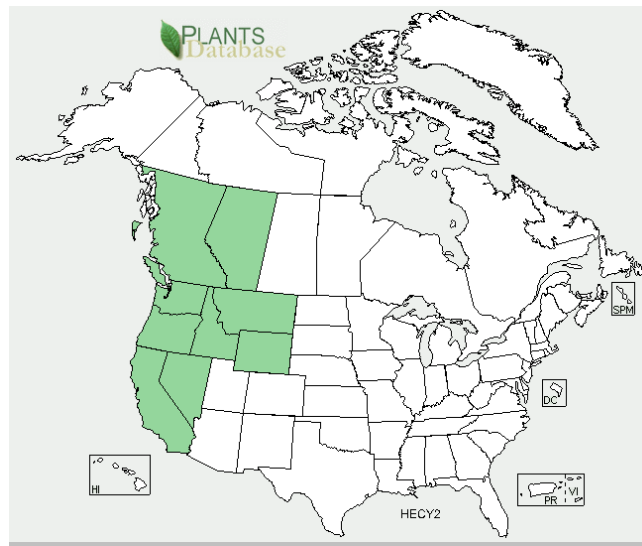
Protocol URL: <https://courses.washington.edu/esrm412/protocols/HECY2>



(3)



(3)



(7)

### TAXONOMY

Plant Family	
Scientific Name	Saxifragaceae
Common Name	Saxifrage Family
Species Scientific Name	
Scientific Name	<i>Heuchera cylindrica</i> Douglas ex Hook.
Varieties	
Sub-species	<i>Heuchera cylindrica</i> var. <i>alpine</i> <i>Heuchera cylindrica</i> var. <i>cylindrical</i>

	<i>Heuchera cylindrica</i> var. <i>glabella</i> <i>Heuchera cylindrica</i> var. <i>orbicularis</i> <i>Heuchera cylindrica</i> var. <i>septentrionalis</i> (7)
Cultivar	'Greenfinch' (6)
Common Synonym(s)	<i>Heuchera cylindrica</i> Dougl. ex Hook. var. <i>alpina</i> Sw. <i>Heuchera cylindrica</i> Dougl. ex Hook. var. <i>cylindrica</i> <i>Heuchera cylindrica</i> Dougl. ex Hook. var. <i>glabella</i> (Torr. & Gray) Wheelock <i>Heuchera cylindrica</i> Dougl. ex Hook. var. <i>orbicularis</i> (Rosendahl, Butters & Lakela) Calder & Savile <i>Heuchera cylindrica</i> Dougl. ex Hook. var. <i>ovalifolia</i> (Nutt. ex Torr. & Gray) Wheelock <i>Heuchera cylindrica</i> Dougl. ex Hook. var. <i>septentrionalis</i> Rosendahl, Butters & Lakela <i>Heuchera cylindrica</i> Dougl. ex Hook. var. <i>suksdorfii</i> (Rydb.) Dorn <i>Heuchera glabella</i> Torr. & Gray <i>Heuchera ovalifolia</i> Nutt. ex Torr. & Gray <i>Heuchera ovalifolia</i> Nutt. ex Torr. & Gray var. <i>orbicularis</i> Rosendahl, Butters & Lakela <i>Heuchera ovalifolia</i> Nutt. ex Torr. & Gray var. <i>thompsonii</i> Rosendahl, Butters & Lakela <i>Heuchera saxicola</i> E. Nels. <i>Heuchera suksdorfii</i> Rydb. (3)
Common Name(s)	Roundleaf Alumroot, Lava Alumroot, Coral Bells, Alum Root, Poker Alumroot, Poker Heuchera, Rock Alumroot (2, 3, 4, 5, 6, 7, 8)
Species Code (as per USDA Plants database)	HECY2
<b>GENERAL INFORMATION</b>	
Geographical range	East Cascades and East of the Cascades in Washington; range spans from British Columbia to California on the west coast, to the east from Alberta to Wyoming. (1, 3, 5, 7, 9)
Ecological distribution	Dry alpine habitats including cliffs, talus slopes, and foothills; prefers other arid regions such as plateaus, grasslands, open forest, Ponderosa pine forest, and subalpine meadows; may also be found in moist shade and dense forest. (1, 3, 5, 7, 9)
Climate and elevation range	3300-9800 feet elevation; Hardiness Zone 4 (1, 2, 5)
Local habitat and abundance	Prefers rocky soils but does well in poor soils; does well in moist or dry soil. (6, 8, 12) Commonly associated species (not exhaustive as it is found in a variety of habitats): <i>Pinus ponderosa</i>

	Pseudotsuga menziesii Saxifraga bronchialis Draba spp. Sedum spp. (1, 4)
Plant strategy type / successional stage	
Plant characteristics	Perennial herb, fast-growing, short-lived, ground cover, rhizomatous. (1, 3, 4, 7, 9, 12)
<b>PROPAGATION DETAILS</b> (By Tara Luna, USDI NPS, Glacier National Park, West Glacier, Montana) (10)	
Ecotype	Open rocky slope, Sun Point, Glacier National Park, Glacier Co., MT, 1585 m elevation
Propagation Goal	Plants
Propagation Method	Seeds
Product Type	Container (plug)
Stock Type	172 mL conetainers
Time to Grow	7 months
Target Specifications	Container seedling height: 5 cm 6 to 10 true leaves Root System: firm plug in conetainer
Propagule Collection Instructions	Seeds are hand collected when capsules begin to turn brown and split. Seeds are black at maturity. Capsules are collected in paper bags and kept in a well ventilated drying shed prior to cleaning.
Propagule Processing/Propagule Characteristics	Seeds are cleaned using a hammermill and office clipper at NRCS. Seed longevity is up to 5 years at 3 to 5C in sealed containers. Seed dormancy is classified as physiological dormancy. Seeds/Kg: 14,000,000/kg % Purity: 100% % Germination: 92%
Pre-Planting Propagule Treatments	60 days cold, moist stratification. Seeds are imbibed in water for 1 hour and are placed in fine mesh bags, buried in moist peat in ventilated containers. Seeds are stratified at 1 to 3C.
Growing Area Preparation / Annual Practices for Perennial Crops	Greenhouse and Outdoor nursery growing facility Sowing Method: Direct Seeding. Seeds are lightly covered with medium. Growing medium used is 6:1:1 milled sphagnum peat, perlite, and vermiculite with Osmocote controlled release fertilizer (13N:13P2O5:13K2O; 8 to 9 month release rate at 21C) and Micromax fertilizer (12%S, 0.1%B, 0.5%Cu, 12%Fe, 2.5%Mn, 0.05%Mo, 1%Zn) at the rate of 1 gram of Osmocote and 0.20 gram of Micromax per 172 ml conetainer.
Establishment Phase Details	Medium is kept slightly moist during germination.

	Initial germination appeared uniform and was complete in 3 weeks. Seedlings are thinned and transplanted at the true leaf stage.
Length of Establishment Phase	4 weeks
Active Growth Phase	Root and shoot development occurs rapidly following germination. Seedlings have 4 to 6 true 2 months after germination. Seedlings are fertilized with 13-13-13 liquid NPK at 100 ppm fertilizer during the growing season.
Length of Active Growth Phase	10 weeks
Hardening Phase	Irrigation is gradually reduced in September and October. Plants are fertilized with 10-20-20 liquid NPK at 200 ppm fertilizer during early fall and leached with clear water before winterization.
Length of Hardening Phase	4 weeks
Harvesting, Storage and Shipping	Total Time to Harvest: 6.5 months Harvest Date: July Storage Conditions: Overwinter in outdoor nursery under insulating foam cover and snow.
Length of Storage	5 months
Guidelines for Outplanting / Performance on Typical Sites	
Other Comments	
<b>PROPAGATION DETAILS</b>	
(David M. Skinner, USDA NRCS, Pullman Plant Materials Center, Pullman, Washington) (13)	
Ecotype	Paradise Creek drainage near Pullman, WA.
Propagation Goal	Plants
Propagation Method	Seeds
Product Type	Container (plug)
Stock Type	
Time to Grow	2 years
Target Specifications	Tight root plug in container
Propagule Collection Instructions	Seeds are collected when the capsules begin to split in late July and early August. Seed can be shaken from the capsules or the entire inflorescence stalk cut from the plant. Seed is brown in color and very small. Seed is stored in paper bags or envelopes at room temperature until cleaned. We determined 7,560,000 seeds/lb. for this ecotype.
Propagule Processing/Propagule Characteristics	Seed shaken from capsules needs no cleaning. Capsules can be crushed to release seed. Seed is cleaned with an air column separator. Larger amounts are cleaned with

	air screen equipment. About 90% of the seed will shatter into the bottom of the sacks. Running the capsules through a hammermill only recovers about 10% more seed. Clean seed is stored in controlled conditions at 40 degrees Fahrenheit and 40% relative humidity.
Pre-Planting Propagule Treatments	Light and extended cold, moist stratification is needed. Cool spring temperatures may also be necessary. In trials at the PMC, surface sown seed subjected to at least 90 days of cool, moist stratification and cool, fluctuating spring temperatures germinated at 83%. Seed subjected to the same conditions but covered germinated at 68%. Seed planted directly in the greenhouse with and without light, and seed subjected to 45 days cool, moist stratification with and without light germinated at rates of 10% or less. Light treatments always germinated at higher rates than the same treatment without light.
Growing Area Preparation / Annual Practices for Perennial Crops	In late November or early December seed is sown in 10 cu. in. Ray Leach Super cell conetainers filled with Sunshine #4. A thin layer of pea gravel is applied to prevent planting medium from floating. If the planting soil is allowed to float, it will cover the seed and exclude light. Seeds are surface sown over the pea gravel. Conetainers are watered deeply and placed outside.
Establishment Phase Details	Containers remain outside. They are watered only during dry spells. Germination will begin as daytime temperatures warm in March, and may occur over 2-4 weeks.
Length of Establishment Phase	4 weeks
Active Growth Phase	Plants are moved to the lath house in June. They are watered every other day if the weather is cool, and every day during hot, dry spells. They are fertilized once per week with a water soluble complete fertilizer containing micro-nutrients. Fertilizer and water are reduced as fall approaches.
Length of Active Growth Phase	1 growing season
Hardening Phase	Since the plants are grown outside, additional hardening is not needed.
Length of Hardening Phase	
Harvesting, Storage and Shipping	Plants are stored in the lath house over winter with no protection except snow cover. Regrowth will begin in early March as soon as temperatures begin to warm. Leaves will usually remain green throughout the winter.

Length of Storage	
Guidelines for Outplanting / Performance on Typical Sites	
Other Comments	No insect or disease problems have been noted. Plants continue to produce good seed crops in increase plantings for at least 5 years. Plants can probably be propagated by division, although we have not attempted it. This method should only be used for plants growing in cultivation. Plants should not be dug up from stands in the wild.
<b>PROPAGATION DETAILS</b> (From communication with Mike Ridling, Seven Oaks Native Plant Nursery, Albany, Oregon, and Plants for a Future website) (6, 11)	
Ecotype	
Propagation Goal	Plants
Propagation Method	Seeds
Product Type	Container (plug)
Stock Type	
Time to Grow	
Target Specifications	Mature plants
Propagule Collection Instructions	
Propagule Processing/Propagule Characteristics	
Pre-Planting Propagule Treatments	
Growing Area Preparation / Annual Practices for Perennial Crops	Our planting mix is mostly bark with pumice and a small amount of compost and fertilizer. (11)
Establishment Phase Details	Seeds germinate easily when planted in the spring and kept moist. (11) Sow seed early spring in a warm greenhouse and only just cover the seed. Germination is usually fairly rapid. Prick out the seedlings when they are large enough to handle and plant them out into their permanent positions in late spring or early summer. The seed can also be sown in the middle of spring in an outdoor seedbed and planted out in early summer. Alternatively, you can sow the seed in an outdoor seedbed in the middle of summer for planting out in the following spring. (6)
Length of Establishment Phase	
Active Growth Phase	We sow into small plugs which we later transplant into 4" band pots. The band pots allow for the extra drainage that is helpful with this species. We let plants almost dry out completely between waterings. (11) Division in March or October. It is best to divide the plants in August or early September, making sure that

	the woody roots are planted quite deeply with only the crown of foliage above the ground. (6)
Length of Active Growth Phase	
Hardening Phase	
Length of Hardening Phase	
Harvesting, Storage and Shipping	
Length of Storage	
Guidelines for Outplanting / Performance on Typical Sites	
Other Comments	
<b>INFORMATION SOURCES</b>	
References	See below
Other Sources Consulted	See below
Protocol Author	Kimberly Ertel
Date Protocol Created or Updated	05/24/17

References:

1. Godsoe, William et al. 2013. Polyploidization in *Heuchera cylindrica* (Saxifragaceae) did not result in a shift in climatic requirements. *American Journal of Botany*, Vol. 100, pp. 496-508.
2. *Heuchera cylindrica*. California Native Plant Society. Retrieved from [http://calscape.org/Heuchera-cylindrica-\(Alpine-Alumroot\)?srchcr=sc5920b98336db1](http://calscape.org/Heuchera-cylindrica-(Alpine-Alumroot)?srchcr=sc5920b98336db1). Last accessed May 22, 2017.
3. *Heuchera cylindrica*. The Burke Museum of Natural History and Culture Herbarium. Retrieved from <http://biology.burke.washington.edu/herbarium/imagecollection.php>. Last accessed May 22, 2017.
4. *Heuchera cylindrica* Douglas ex Hook. Consortium of Midwest Herbaria. Retrieved from <http://www.midwetherbaria.org/portal/taxa/index.php?taxon=heuchera+cylindrica&form-submit=Search+Terms>. Last accessed May 22, 2017.
5. *Heuchera cylindrica* Douglas ex Hook. E-Flora BC: Electronic Atlas of the Flora of British Columbia. Lab for Advanced Spatial Analysis, Department of Geography, University of British Columbia, Vancouver. Retrieved from <http://linnet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Heuchera%20cylindrica>. Last accessed May 22, 2017.
6. *Heuchera cylindrica* – Douglas. ex Hook. *Plants for a Future*. Retrieved from <http://www.pfaf.org/user/plant.aspx?latinname=Heuchera+cylindrica>. Last accessed May 22, 2017.
7. *Heuchera cylindrica* Douglas ex Hook. United States Department of Agriculture. Retrieved from <https://plants.usda.gov/core/profile?symbol=HECY2>. Last accessed May 22, 2017.
8. *Heuchera cylindrica*. Seven Oaks Native Nursery. Retrieved from <https://www.sevenoaksnativenursery.com/native-plants/perennials-and-bulbs/heuchera-cylindrica/>. Last accessed May 22, 2017.

9. Hitchcock, C. Leo and Arthur Cronquist. 1973. Flora of the Pacific Northwest. University of Washington Press, Seattle, Washington.
10. Luna, Tara. 2008. Protocol Information: Heuchera (cylindrica). Native Plant Network Propagation Protocol Database. Retrieved from <https://nnp.rngr.net/renderNPNProtocolDetails?selectedProtocolIds=saxifragaceae-heuchera-202>. Last accessed May 22, 2017.
11. Ridling, Mike. Seven Oaks Native Nursery. Personal communication, May 17, 2017.
12. Robson, Kathleen A. et al. 2008. Encyclopedia of Northwest Native Plants for Gardens and Landscapes. Timber Press Incorporated, Portland, Oregon.
13. Skinner, David M. 2004. Protocol Information: Heuchera (cylindrica). Native Plant Network Propagation Protocol Database. Retrieved from <https://rng.net/nnp/propagation/protocols/saxifragaceae-heuchera-2838>. Last accessed May 22, 2017.

References Not Used:

1. *Heuchera cylindrica*. Lady Bird Johnson Wildflower Center. University of Texas at Austin. Retrieved from [http://www.wildflower.org/plants/result.php?id\\_plant=HECY2](http://www.wildflower.org/plants/result.php?id_plant=HECY2). Last accessed May 22, 2017.
2. *Heuchera cylindrica*. Missouri Botanical Garden. Retrieved from <http://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?taxonid=286885&isprofile=0&>. Last accessed May 22, 2017.
3. *Heuchera cylindrica*. Rugged Country Plants. Retrieved from <http://www.ruggedcountryplants.com/perennial/heuchera-cylindrica.htm>. Last accessed May 22, 2017.
4. *Heuchera cylindrica* Dougl. ex Hook. Montana Plant Life. Retrieved from <http://montana.plant-life.org/index.html>. Last accessed May 22, 2017.
5. Hidayati, Sidi N. and Jeffrey L. Walck. 2002. Contrasting seed germination patterns for intracontinental disjuncts of *Heuchera* (Saxifragaceae) in North America: the eastern temperate *H. parviflora* and western montane *H. cylindrica*. Canadian Journal of Botany, Vol. 80, pp. 1185-1192.
6. Kozloff, Eugene N. 2005. Plants of Western Oregon, Washington & British Columbia. Timber Press Incorporated, Portland, Oregon.
7. Rose, Robin et al. 1998. Propagation of Pacific Northwest Native Plants. Oregon State University Press, Corvallis, Oregon.