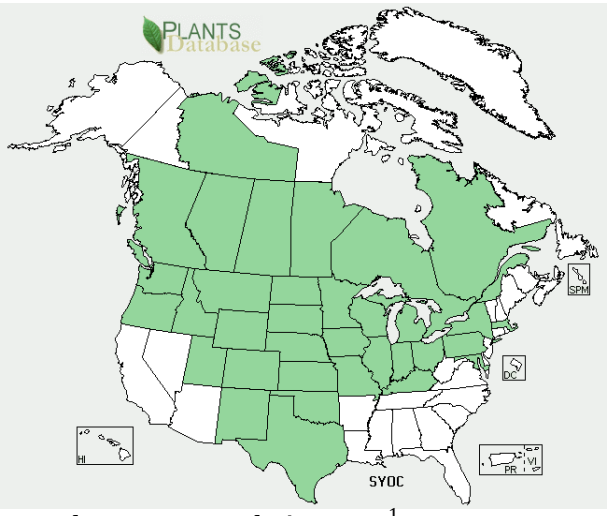
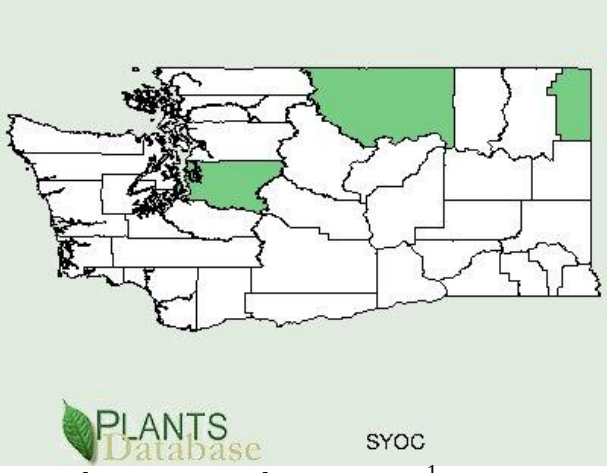
Plant Propagation Protocol for *Symphoricarpos occidentalis*
ESRM 412 – Native Plant Production



Distribution in North America[1]



Distribution in Washington state[1]

TAXONOMY	
Family Names	
Family Scientific Name:	Caprifoliaceae
Family Common Name:	Honeysuckle
Scientific Names	
Genus:	*Symphoricarpos* Duham.
Species:	*Symphoricarpos occidentalis*
Species Authority:	Hook.
Variety:	
Sub-species:	
Cultivar:	
Authority for Variety/Sub-species:	
Common Synonym(s) (include full scientific names (e.g., *Elymus glaucus* Buckley), including variety or subspecies information)	
Common Name(s):	Western snowberry, wolfberry[1] Buckbrush[2] Western wolfberry[4]
Species Code (as per USDA Plants database):	SYOC[1]
GENERAL INFORMATION	
Geographical range (distribution maps for North America and Washington state)	See above maps.
Ecological distribution (ecosystems	Dry soils, particularly on prairies.[2]

it occurs in, etc):	
Climate and elevation range	Located in zones 1,3,4,5,6,7,8,9 according to the USDA. This includes the Northeast, North Central, North Plains, Central Plains, South Plains, Southwest, Intermountain, and Northwest areas of the United States. [1]
Local habitat and abundance; may include commonly associated species	Known to form dense colonies along ditches, streams, and floodplains; and in moist, open, grassy swales on mesas and plains. These colonies range from 3 to 700 feet (1-200 m) or greater in diameter.[4] Can be weedy in Nebraska and Great Plains area[3] A common shrub component in mixed-grass prairies.[4]
Plant strategy type / successional stage (stress-tolerator, competitor, weedy/colonizer, seral, late successional)	Low, thicket forming shrubs[2] Generally insect-pollinated. However, self-pollination may take place when pollen falls on stigmas from horizontal or pendulous flowers.[4] The continental-type climates that it occurs in are characterized by extreme temperature ranges and light to moderate precipitation. It is able to survive moderate drought conditions.[4] Occurs on most soil textures except for loose sands. Where it occurs on floodplains, the soils are usually fine textured, composed primarily of silt with moderate quantities of clay and fine sand. It has been found on infertile sand or rocky substrates, rich loams, or compact clays. It can tolerate "imperfectly" drained soils and flooding, but cannot survive in prolonged flooding. [4] Common on mildly alkaline to slightly acidic soils.[4]
Plant characteristics (life form (shrub, grass, forb), longevity, key characteristics, etc)	Shrub[4] It rarely establishes by seedling, but it can regenerate vegetatively by rhizomes.[4] Seeds are most commonly dispersed by small mammals or birds[4] *Symphoricarpos occidentalis* have white berries and are usually 40 to 150 cm tall, erect to spreading, densely

	opposite-branched, thicket-forming, deciduous shrubs. Leaves are 1 to 8 cm long by 0.3 to 4 cm wide, oval or ovate to roundish, opposite, simple, with entire leaf margins.[6]
PROPAGATION DETAILS Of the genus Symphoricarpos according to the USDA	
Ecotype (this is meant primarily for experimentally derived protocols, and is a description of where the seed that was tested came from):	N/A
Propagation Goal (Options: Plants, Cuttings, Seeds, Bulbs, Somatic Embryos, and/or Other Propagules):	Plants
Propagation Method (Options: Seed or Vegetative):	Seed
Product Type (options: Container (plug), Bareroot (field grown), Plug + (container-field grown hybrids, and/or Propagules (seeds, cuttings, poles, etc.))	Bareroot
Stock Type:	N/A
Time to Grow (from seeding until plants are ready to be outplanted):	No information
Target Specifications (size or characteristics of target plants to be produced):	No information
Propagule Collection (how, when, etc):	The berries can be collected by stripping the clusters from the branches at any time after ripening onto a canvas or the fruits may be picked by hand.[2,5] Fruit ripening occurs in September.[2] Fruits persist on the plants until the following spring, except for those consumed by birds and mammals, making collection of fruit relatively easy.[6] The seeds that are collected in early fall contain considerable moisture and require careful handling to prevent heating.[2,6]
Propagule Processing/Propagule Characteristics (including seed density (# per pound), seed longevity, etc):	*Symphoricarpos occidentalis* yields 5 to 10 pounds of cleaned seed per 100 pounds of fruit or an average of 73,000 cleaned seeds per pound of fruit.[2]

	Seeds will retain considerable germinability for long periods if kept at low temperatures. Seed will also remain viable for at least 2.5 years in room temperature.[2]
Pre-Planting Propagule Treatments (cleaning, dormancy treatments, etc):	After twigs, leaves, and other debris have been sifted out, the fruit can be readily extracted by macerating the berries in water and allowing the pulp and empty seeds to float away. Dried fruit should be soaked for several hours prior to maceration.[2,5,6] After drying and fanning, the seed is ready for storage or use.[2,5] Dormancy of *Symphoricarpos* is due to a combination of a hard, tough seed coat with a rudimentary or partially developed embryo.[2,5] The seeds can be germinated by exposing them to warm plus cold stratification or by acid treatment followed by low-temperature stratification.[2] Stratification Medium: sand or peat. Duration of stratification*: 90-120 days at room temperature (68-86 degrees F.) plus 180 days at 41 degrees F. Other methods: Soak in sulfuric acid 75 minutes then stratify for 180 days at 41 degrees F. Soak in sulfuric acid 60 minutes then stratify for several weeks at 77 degrees F. plus 180 days at 41 degrees F. [2]
Growing Area Preparation / Annual Practices for Perennial Crops (growing media, type and size of containers, etc):	About 30 viable seeds should be sown per square foot of nursery row and covered with soil to a depth of about 1/4th inch.[2,6] Or 30 seedlings can be planted per square foot of soil and covered with 1/4th inch of soil and 3/4th inch of sawdust mulch.[5,6]
Establishment Phase (from seeding to germination):	No information
Length of Establishment Phase:	No information
Active Growth Phase (from germination until plants are no	No information

*These are the results for *S. albus*. No results for *S. occidentalis*; probably should be treated like *S. albus*.

longer actively growing):	
Length of Active[2] Growth Phase:	No information
Hardening Phase (from end of active growth phas[3]e to end of growing season; primarily related to the development of cold-hardiness and preparation for winter):	No information
Length of Hardening Phase:	No information
Harvesting, Storage and Shipping (of seedlings):	No information
Length of Storage (of seedlings, between nursery and outplanting):	No information
Guidelines for Outplanting / Performance on Typical Sites (eg, percent survival, height or diameter growth, elapsed time before flowering):	Plant competition needs to be reduced to a minimum during the first season. When seeding in rangeland conditions, species should be mixed with other adapted browse and forage plants and preferably planted in rows, strips, or blocks separate from grasses.[7]
Other Comments (including collection restrictions or guidelines, if available):	N/A
PROPAGATION DETAILS of the genus Symphoricarpos	
Ecotype (this is meant primarily for experimentally derived protocols, and is a description of where the seed that was tested came from):	N/A
Propagation Goal (Options: Plants, Cuttings, Seeds, Bulbs, Somatic Embryos, and/or Other Propagules):	Plants
Propagation Method (Options: Seed or Vegetative):	Vegetative
Product Type (options: Container (plug), Bareroot (field grown), Plug + (container-field grown hybrids, and/or Propagules (seeds, cuttings, poles, etc.))	Unknown (probably Container or Bareroot)
Stock Type:	N/A
Time to Grow (from seeding until plants are ready to be outplanted):	No information
Target Specifications (size or	No information

characteristics of target plants to be produced):	
Propagule Collection (how, when, etc):	No information
Propagule Processing/Propagule Characteristics (including seed density (# per pound), seed longevity, etc):	N/A
Pre-Planting Propagule Treatments (cleaning, dormancy treatments, etc):	Vegetative propagation can be accomplished using hard or softwood cuttings of aerial stems or roots (rhizomes). In one study, roots form readily on both suckers and older stems that were collected in winter although the water in which they were placed was left unchanged and unaerated for over two months. However, stems treated similarly that were collected in full leaf in August produced no roots.[8]
Growing Area Preparation / Annual Practices for Perennial Crops (growing media, type and size of containers, etc):	Cuttings and transplanting of pulled-up wildlings and pieces of stem with roots can be especially successful when planted in early spring.[6] Cuttings should be irrigated when set out and as needed afterward until they are well established.[6]
Establishment Phase (from seeding to germination):	No Information
Length of Establishment Phase:	No Information
Active Growth Phase (from germination until plants are no longer actively growing):	No Information
Length of Active Growth Phase:	No Information
Hardening Phase (from end of active growth phase to end of growing season; primarily related to the development of cold-hardiness and preparation for winter):	No Information
Length of Hardening Phase:	No Information
Harvesting, Storage and Shipping (of seedlings):	No Information
Length of Storage (of seedlings, between nursery and outplanting):	No Information
Guidelines for Outplanting / Performance on Typical Sites (eg, percent survival, height or diameter growth, elapsed time	Plant competition needs to be reduced to a minimum during the first season. When seeding in rangeland conditions, species should be mixed with other adapted browse and forage plants and preferably planted in rows,

before flowering):	strips, or blocks separate from grasses.[7]
Other Comments (including collection restrictions or guidelines, if available):	N/A
INFORMATION SOURCES	
References (full citations):	[1]"*Symphoricarpos occidentalis* Hook." The PLANTS database. USDA, NRCS. 12 May 2010. <http://plants.usda.gov/java/nameSearch?keywordquery=Symphoricarpos+occidentalis&mode=sciname&submit.x=17&submit.y=10 >. [2] USDA Forest Service. 1948. *Woody-plant seed manual*. Miscellaneous Publication 654. US [3]Stubbendieck, J., G.Y. Friisoe, & M.R. Bolick. *Weeds of Nebraska and the Great Plains*. Nebraska Department of Agriculture, Bureau of Plant Industry, Lincoln, Nebraska. [4]Hauser, A. Scott. 2007. Symphoricarpos occidentalis. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2010, May 12] [5]USDA Forest Service. 1974. *Seeds of Woody Plants in the United States*. Agricultural Handbook No. 450. Washington DC. [6]Olson, David, R.L. Barnes, & R.P. Karrfalt. USDA Forest Service 2008. "S." *Woody Plant Seed Manual: Part 2.* Agricultural Handbook No. 727. Washington DC. [7]Wasser CH. 1982. *Ecology and culture of selected species useful in revegetating disturbed lands in the West*. Washington, DC: USDI Fish and Wildlife Service. p. 347. [8]Pelton, John. "Studies on the Life-History of *Symphoricarpos occidentalis* Hook., in Minnesota." *Ecological Monographs*, Vol. 23, No. 1. Jan., 1953. p. 17-39.
Other Sources Consulted (but that contained no pertinent information) (full citations):	USDA, ARS, National Genetic Resources Program. *Germplasm Resources Information Network - (GRIN).* National Germplasm Resources Laboratory, Beltsville,

	Maryland. 13 May 2010. < http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?315604>. Young, James and Cheryl Young. Seeds of Woody Plants in North America. Portland: Dioscorides Press, 1992. Dirr, Michael and Charles Heuser, Jr. *The Reference Manual of Woody Plant Propogation: From Seed to Tissue Culture.* Cary, NC: Varsity Press, Inc., 2006. Hidayati, Siti N., Baskin, Jerry M., Baskin, Carol C. *Dormancy-breaking and germination requirements for seeds of Symphoricarpos orbiculatus (Caprifoliaceae.)* Am. J. Bot. 2001 88: 1444-145.
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