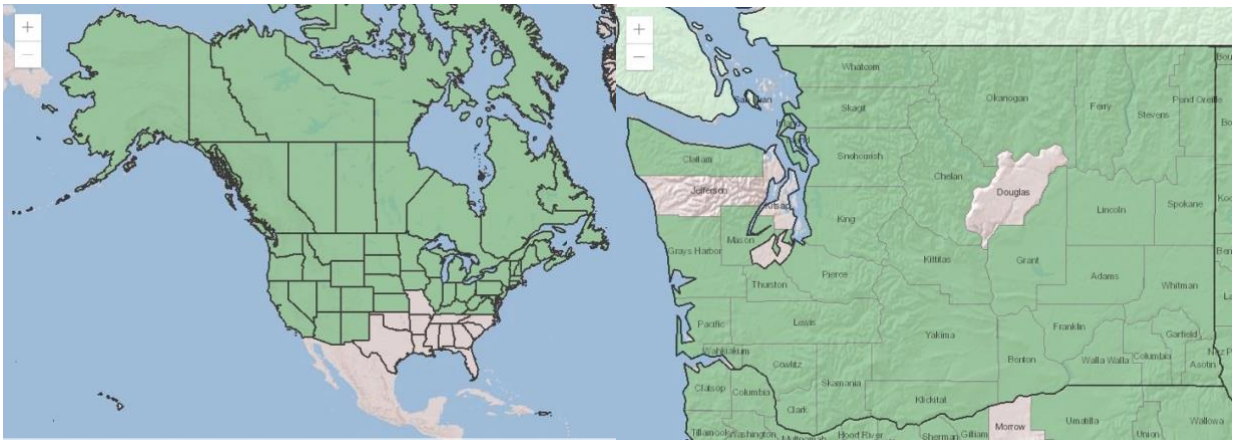
Plant Propagation Protocol for *Cornus sericea*
ESRM 412 – Native Plant Production
URL: https://courses.washington.edu/esrm412/protocols/2021/COSE16.pdf

Cornus sericea. Source: Herman, D.E., et al, ND State Soil Conservation Committee, United States, North Dakota. Provided By ND State Soil Conservation Committee



Distribution maps of *C. sericea* for North America and Washington State. Source: USDA Plants Database

TAXONOMY	
Plant Family	
Scientific Name	Cornaceae
Common Name	Dogwood family
Species Scientific Name	
Scientific Name	*Cornus sericea* L.
Varieties	*Cornus sericea* L. var. *interior* (Rydb.) H. St. John
Sub-species	*Cornus sericea* L. ssp. s*ericea* *Cornus sericea* L. *ssp. occidentalis* (Torr. & A. Gray) Fosberg *Cornus sericea* L. ssp. *stolonifera* (Michx.) Fosberg
Cultivar	N/A
Common Synonym(s)	*Cornus stolonifera* var. *nevadensis* Jepson *Cornus stolonifera* Michaux
Common Name(s)	Red osier dogwood, American dogwood, redstem dogwood, red willow
Species Code (as per USDA Plants database)	COSE16
GENERAL INFORMATION	
Geographical range	See above for distribution maps for North America and for the Pacific Northwest. *C. sericea* is widely distributed across North America. It is found from California and north to Alaska, and across the eastern United States south to Mexico.[1]
Ecological distribution	Primarily occurs in riparian ecosystems: the edges of lakes and ponds, within wetlands, and along streams.[1]
Climate and elevation range	*C. sericea* generally grows at altitudes less than 2500m.[1]
Local habitat and abundance	Red osier dogwood prefers soils that are fully saturated for some part of the growing season but is not well-adapted to long-term root saturation. It does well in nitrogen-rich, high-moisture soils at the margins of wetlands where the soil might be fully saturated in spring but dry by the end of summer.[1] *C. sericea* prefers slightly shaded areas.[2]
Plant strategy type / successional stage	Stress-tolerator
Plant characteristics	*C. sericea* is a woody deciduous shrub 4.6 to 20 feet in height. From autumn to late spring, the branches and twigs are reddish in color, and are smooth to the touch. Throughout summer, the branches, twigs, and leaves are bright green. The leaves are simple and opposite, 2 to 4 inches long, and have smooth margins with rounded bases. They are dark green above and hairy and lighter green below, with falsely parallel veins.

	The stems are clustered, with branches that occasionally arch to the ground and root at the nodes. [3] Flowering occurs from June to August, with an inflorescence of a cyme. The flowers themselves are cream-colored and less than an inch in diameter. The berries are white and smooth on the faces with furrows down the sides.[1] Deer browse on red osier dogwood year-round, and many shorebirds and waterfowl use it for habitat. The fragrant flowers attract bees.[2]
PROPAGATION DETAILS As prepared by Crowder et. al., 2006[4]	
Ecotype	Cheney, WA
Propagation Goal	Plants
Propagation Method	Vegetative
Product Type	Container (plug)
Stock Type	10 cubic inch container
Time to Grow	15 weeks
Target Specifications	Cohesive root plug
Propagule Collection Instructions	In late May or early June, collect semi-hardwood tip cuttings. The cuttings should be 6 to 8 inches long with at least 1 node. Cut far enough below the last node to allow for insertion into the rooting media. Leave all leaves on the top node of the cutting.
Propagule Processing/Propagule Characteristics	Cuttings are timed with a diagonal cut at the basal end.[5]
Pre-Planting Propagule Treatments	Treat the cuttings with fungicide drench and allow them to drain moisture prior to treating with rooting hormone. A 0.3% Indole-butyric acid rooting powder is used to treat the cut end about ½ inch up the stem. Place the cuttings in course horticultural perlite. Cuttings are rooted on standard greenhouse benches.[5]
Growing Area Preparation / Annual Practices for Perennial Crops	Plants are rooted in 4-inch-deep metal flats with bottom drain holes. The flats are then set on rubber heating mats which are regulated to keep the rooting media at a temperature of about 78 degrees Fahrenheit. Mist the plants every 15 minutes for 15 seconds at a time. Use 24 hour/day metal halide lamps and keep the temperature of the room at about 68 degrees Fahrenheit.
Establishment Phase Details	Intermittent misting is maintained until vigorous shoot and root growth is apparent. Irrigate the media regularly to keep it evenly moist.[5]
Length of Establishment Phase	2 to 4 weeks
Active Growth Phase	The first portion (8 to 12 weeks) is performed in the greenhouse. To minimize root disease, allow the media to dry partly in between irrigating. As the seedlings grow,

	the intervals between irrigation events decreases – at first, irrigate every 3 to 4 days, then every 2 to 3 days, then every 1 to 2 days. Irrigate early in the morning. Fertilizer is applied with irrigation, and similarly decreases in ppm of N over time. The second portion (12 to 14 weeks) occurs in the shade house. Seedlings are irrigated once every other day, and no fertilizer is used.[5]
Length of Active Growth Phase	12 to 14 weeks[5]
Hardening Phase	After the cuttings have 3 to 4 roots at least ¼ inch long, move the plants to hardening mist table without bottom heat. Plant the cuttings in a well-drained potting mix such as Sunshine #4. Increase the interval between misting to harden plants prior to placing in a general growth facility. To acclimate the seedlings to water stress and to inhibit further shoot growth, the interval between irrigation becomes progressively longer. Seedlings are considered "hardened" once buds have formed and leaves have been shed.[5]
Length of Hardening Phase	1 to 2 weeks
Harvesting, Storage and Shipping	In late October to early November, seedlings are moved from the shade house into a cold frame. Seedlings are irrigated on an as-needed basis, and no supplemental light is provided.[5]
Length of Storage	5 months[5]
Guidelines for Outplanting / Performance on Typical Sites	No information provided
Other Comments	No information provided
PROPAGATION DETAILS As prepared by Luna et. al., 2008[6]	
Ecotype	Riparian zone, Camas road, Glacier National Park, Flathead County, Montana. Elevation: 1000m
Propagation Goal)	Plants
Propagation Method	Seed
Product Type	Container (plug)
Stock Type	3 L containers
Time to Grow	2 years
Target Specifications	Container seedling with a height of 30 cm, caliper of 5 mm, and a firm plug root system in 3L containers.
Propagule Collection Instructions	Mature fruits are collected from July to October. Seeds are hand collected in late August and early September when fruit turns blue. They are collected in plastic bags and kept under refrigeration prior to cleaning.
Propagule Processing/Propagule Characteristics	Seeds are cleaned by maceration using a Dyb-Vig seed cleaner and screens. Seeds can last up to 20 years at 1 to 3

	degrees Celsius in sealed containers. Seed dormancy is classified as a physical-physiological dormancy. Seeds/Kg: 40,700/ kg % Purity: 100% % Germination: 80%
Pre-Planting Propagule Treatments	Seeds are scarified with sulfuric acid for 20 to 30 minutes followed by a neutralization of lime and a running water rinse for 48 hours to remove acid residue. Seeds are then placed into a 90-day cold, moist stratification in which seeds are placed in fine mesh bags and buried in moist peat moss in ventilated containers at 1 to 3 degrees Celsius. Note that some seed lots may not require acid scarification.
Growing Area Preparation / Annual Practices for Perennial Crops	The growing area is an outdoor nursery growing facility. Seeds are directly sown and lightly covered with medium. The 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	Germination is uniform and usually complete after 2 weeks. True leaves appear 2 weeks after germination.
Length of Establishment Phase	4 weeks
Active Growth Phase	Following germination, seedling growth rate is rapid. Plants are fertilized with 20-20-20 liquid NPK at 100 ppm weekly.
Length of Active Growth Phase	16 weeks
Hardening Phase	During August and September, plants are fertilized with 10-20-20 liquid NPK at 200 ppm. Irrigation is gradually reduced in October, and plants are given one final irrigation prior to winterization.
Length of Hardening Phase	4 weeks
Harvesting, Storage and Shipping	Total time to harvest is 1.5 years for 3L containers. Store in outdoor nursery under insulating foam.
Length of Storage	5 months
Guidelines for Outplanting / Performance on Typical Sites	No information provided
Other Comments	C. sericea is tolerant of excessively cold temperatures because water freezes extra cellularly in the tissue. Hardened stock can be winter stored with minimal protection.
INFORMATION SOURCES	
References	See below
Other Sources Consulted	See below

Protocol Author	Jane FitzGerald
Date Protocol Created or Updated	05/24/21

References

[1]"Cornus Sericea L." *USDA Plants Database*, plants.sc.egov.usda.gov/home/plantProfile?symbol=COSE16.

[2]"Plant Database." *Lady Bird Johnson Wildflower Center - The University of Texas at Austin*, www.wildflower.org/plants/result.php?id_plant=cose16.

[3]*Cornus Sericea in Flora of North America @ Efloras.org*, www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=250101783.

[4]Crowder, Wayne. 2006. Propagation protocol for production of Container (plug) *Cornus sericea* L. plants 10 cubic inch container; USDA NRCS - Pullman Plant Materials Center Pullman, Washington. In: Native Plant Network. URL: http://NativePlantNetwork.org (accessed 2021/05/24). US Department of Agriculture, Forest Service, National Center for Reforestation, Nurseries, and Genetic Resources.

[5]Loveall, Mark W.; Harrington, John T. 2008. Propagation protocol for production of Container (plug) *Cornus sericea* plants 164 ml conetainer; New Mexico State University-Mora Research Center Mora, New Mexico. In: Native Plant Network. URL: http://NativePlantNetwork.org (accessed 2021/05/24). US Department of Agriculture, Forest Service, National Center for Reforestation, Nurseries, and Genetic Resources.

[6]Luna, Tara; Evans, Jeff; Wick, Dale. 2008. Propagation protocol for production of Container (plug) *Cornus sericea* L. plants 3 L (gal) containers; USDI NPS - Glacier National Park West Glacier, Montana. In: Native Plant Network. URL: http://NativePlantNetwork.org (accessed 2021/05/24). US Department of Agriculture, Forest Service, National Center for Reforestation, Nurseries, and Genetic Resources.

Other sources consulted

Schuller, Reid., et al. Forest Creeks Research Natural Area : Guidebook Supplement 39. U.S. Dept. of Agriculture, Forest Service, Pacific Northwest Research Station, 2010.

Sheridan, Rebecca A., and Davis, Anthony S. Germination and Development of Two Inland Northwest Native Plants. University of Idaho, 2016.

Cornus Sericea, ucjeps.berkeley.edu/eflora/eflora_display.php?tid=20402.

Young, Betty. 2001. Propagation protocol for production of Container (plug) *Cornus sericea* L. plants Deepot 40; San Francisco, California. In: Native Plant Network. URL: http://NativePlantNetwork.org (accessed 2021/05/25). US Department of Agriculture, Forest Service, National Center for Reforestation, Nurseries, and Genetic Resources.

Barner, Jim. 2007. Propagation protocol for production of Propagules (seeds, cuttings, poles, etc.) *Cornus sericea* L. seeds USDA FS - R6 Bend Seed Extractory Bend, Oregon. In: Native Plant Network. URL: http://NativePlantNetwork.org (accessed 2021/05/25). US Department of Agriculture, Forest Service, National Center for Reforestation, Nurseries, and Genetic Resources.