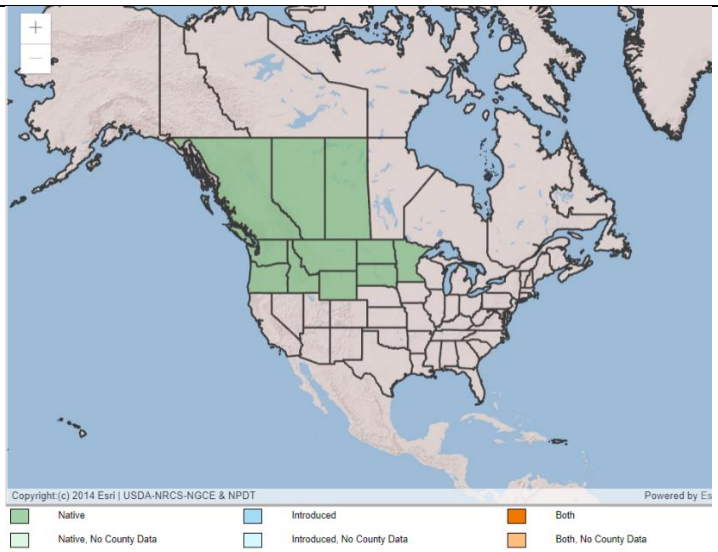
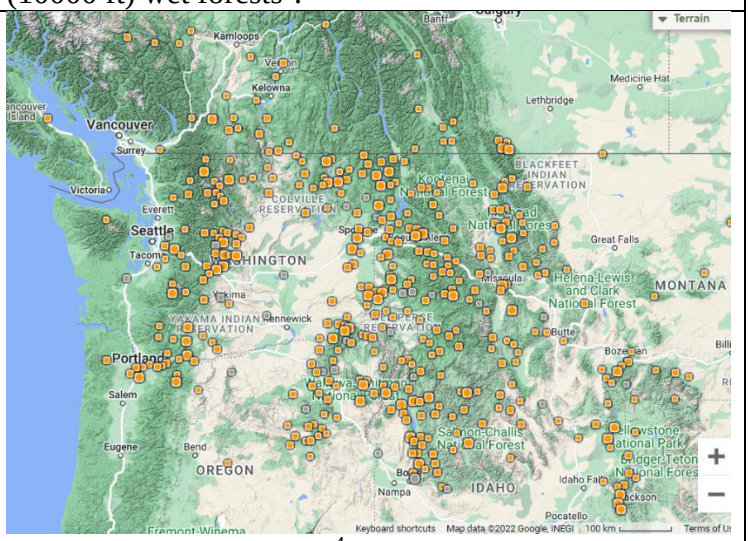
Plant Propagation Protocol for *Spiraea lucida*
ESRM 412 – Native Plant Production
URL: https://courses.washington.edu/esrm412/protocols/2022/SPLU5

(Source: biology.burke.washington.edu[1])

TAXONOMY	
Plant Family	
Scientific Name	Rosaceae[2]
Common Name	Rose Family[2]
Species Scientific Name	
Scientific Name	*Spiraea lucida* Douglas ex Greene[2]
Varieties	No information found
Sub-species	No information found
Cultivar	No information found
Common Synonym(s)	*Spiraea betulifolia* Pall. var. *lucida* (Douglas ex Greene) C.L. Hitchc.[2], *Spiraea betulifolia* Pall. ssp. *lucida* (Douglas ex Greene) Roy L. Taylor & MacBryde[2]
Common Name(s)	Shinyleaf spirea[2]
Species Code (as per USDA Plants database)	SPLU5[2]
GENERAL INFORMATION	

Geographical range	 (Source: plants.usda.gov[2])
Ecological distribution	Commonly found on brushy or open slopes, as well as in forests from the foothills through the montane zone[3]. *S. lucida* grows well on dry, rocky sites because of its rhizomatous nature[3].
Climate and elevation range	It is often abundant in low-elevation (1000-4000 ft) dry forests but can also be found in some high-elevation (10000 ft) wet forests[3].
Local habitat and abundance	 (Source: pnwherbaria.org[4]) *S. lucida* is fairly evenly spread across the Pacific Northwest in its elevation range. The species occurs abundantly in Eastern Washington, Eastern Oregon, and Idaho, but it is also seen fairly commonly on the Western side of the Cascades as well[4]. Found in stream banks and open to wooded areas[1].
Plant strategy type / successional stage	*S. lucida* is a satisfactory indicator plant for varying climatic conditions. Its canopy cover declines gradually

	beneath a tree overstory, making it an indicator of late-seral to climax conditions[3].
Plant characteristics	Deciduous, nearly glabrous shrubs from strong rhizomes. Stems grow to 2.5-6 dm tall. Leaves are alternate, ovate-oblong to obovate, coarsely and doubly serrate, dark green on the upper surface, and pale on the lower surface. Inflorescence is a flat-topped, broad raceme of small, dull white flowers. Fruit follicles are small, leathery, and mostly glabrous[1].
PROPAGATION DETAILS The following propagation details found are specific to *Spiraea betulifolia* Pallas[5], which is a synonym of *S. lucida* Douglas ex Greene. Since the two species are very closely related, the propagation techniques will be similar.	
Ecotype	West Glacier, 1100 m Glacier National Park, Flathead, Co., MT[5]
Propagation Goal	Plants[5]
Propagation Method	Seed[5]
Product Type	Container (plug)[5]
Stock Type	160 ml containers[5]
Time to Grow	8 months[5]
Target Specifications	Stock type: container seedling Height: 15 cm Caliper: 5 mm Root system: Firm plug in containers[5]
Propagule Collection Instructions	Seeds are hand collected when follicles begin to split open in mid to late September. Follicles are collected in paper bags and kept in a well-ventilated drying shed prior to cleaning. Seeds are light tan at maturity.[5]
Propagule Processing/Propagule Characteristics	Seeds are extracted by crushing follicles. Material is screened to remove chaff. Seeds are thin, elongated, and very small. Seed dormancy is classified as physiological dormancy. Purity percentage is 50%. Seed germination percentage is 50% -80%.[5]
Pre-Planting Propagule Treatments	Seeds are placed in a 60-day cold, moist stratification. The tiny seeds are moistened and placed on moist, rolled paper towels inserted into an opened zip-lock bag, and held under refrigeration at 3˚C. Seeds are remoistened as needed during stratification. Satisfactory germination also occurs without a stratification treatment.[5]
Growing Area Preparation / Annual Practices for Perennial Crops	Greenhouse and outdoor nursery growing facility. Seeds are sown via direct seeding and must be surface sown for the light requirement. The growing medium used is a 6:1:1 milled sphagnum peat, perlite, and vermiculite with Osmocote controlled release fertilizer and

	Micromax fertilizer at the rate of 1 gram of Osmocote and 0.20 grams of Micromax per container.[5]
Establishment Phase Details	Germination continues over a 3-week period. Containers are misted twice daily after sowing and until seedlings have emerged. Seedlings have true leaves 2 to 3 weeks after germination and are thinned to 1 per cell at this stage.[5]
Length of Establishment Phase	4 weeks[5]
Active Growth Phase	Plants grow rapidly following establishment and are regularly fertilized with 20-10-20 liquid NPK at 100 ppm. Plants are root tight in containers in 4 months. Seedlings also reached flowering maturity 4 months after germination.[5]
Length of Active Growth Phase	16 weeks[5]
Hardening Phase	Plants are fertilized with 10-20-20 liquid NPK at 200 ppm in August and September. Pots are leached with clear water in October.[5]
Length of Hardening Phase	8 weeks[5]
Harvesting, Storage and Shipping	Total time to harvest: 8 months from seed Harvest date: September Storage conditions: Overwinter in outdoor nursery under insulating foam and snow[5]
Length of Storage	5 months[5]
Guidelines for Outplanting / Performance on Typical Sites	No information found
Other Comments	This species is susceptible to fire blight if high nitrogen fertilizers are used during production[5]

PROPAGATION DETAILS

The following propagation details found are specific to *Spiraea betulifolia* Pallas[6], which is a synonym of *S. lucida* Douglas ex Greene. Since the two species are very closely related, the propagation techniques will be similar.

Ecotype	Open Lodgepole forest, Lake McDonald, Glacier National Park, MT 1000 meters elevation[6]
Propagation Goal	Plants[6]
Propagation Method	Vegetative[6]
Product Type	Container (plug)[6]
Stock Type	1.5L containers[6]
Time to Grow	2 years[6]
Target Specifications	Stock type: Container cutting Height: 15 cm Caliper: 5 mm Root system: Firm plug in container[6]
Propagule Collection Instructions	Cuttings are collected from healthy field plants in early to mid-June[6]

Propagule Processing/Propagule Characteristics	Cuttings are collected in plastic bags and kept under refrigeration prior to pre-treatment[6]
Pre-Planting Propagule Treatments	Vegetative propagation method: Pre-rooting Type of cutting: Summer softwood stem tip cuttings Cutting treatments: Cuttings were re-cut and terminal buds were removed. Cuttings were dipped into Domain fungicide bath for 2 minutes to remove surface pathogens[6] Cuttings were treated with 2000 ppm liquid IBA rooting hormone and were struck in the mist bed with bottom heat[6] Rooting Percentage: 80% [6]
Growing Area Preparation / Annual Practices for Perennial Crops	The outdoor mist bed has automatic intermittent mist that is applied at 6 second intervals every 6 minutes. Too frequent misting will result in leaf and stem rot. Bottom heat is maintained at 21˚C with heating cables 12 cm beneath rooting media.[6] Rooting media is 50% perlite and 50% sand.[6] Mist bed is covered with shade cloth during rooting.[6]
Establishment Phase Details	After cuttings have rooted, they are potted into 1.5L containers using 50% 6:1:1 milled sphagnum peat, perlite, and vermiculite and 50% sand with Osmocote controlled release fertilizer and Micromax fertilizer at the rate of 5.0 grams of Osmocote and 2.0 grams of Micromax per container and placed in shadehouse for the rest of the growing season.[6]
Length of Establishment Phase	4 weeks[6]
Active Growth Phase	Growth is rapid following transplanting from the mist bed to 3L containers. Plants were muti-stemmed and root tight in 1.5L containers in 1 year.[6]
Length of Active Growth Phase	8 weeks[6]
Hardening Phase	Plants were fertilized with 10-20-20 liquid NPK at 200 ppm during September and October and given one final irrigation before overwintering.[6]
Length of Hardening Phase	4 weeks[6]
Harvesting, Storage and Shipping	Total time to harvest: 2 years from cuttings Harvest date: September Storage conditions: Overwinter in outdoor nursery under insulating foam cover and snow.[6]
Length of Storage	5 months[6]
Guidelines for Outplanting / Performance on Typical Sites	No information found
Other Comments	This species is susceptible to fire blight if excessive high nitrogen fertilizers are used while under production.[6]
INFORMATION SOURCES	

References	See references below
Other Sources Consulted	See references below
Protocol Author	Austin Bleth
Date Protocol Created or Updated	05/23/22

References

[1]*Spiraea lucida.* (n.d.). Burke Herbarium Image Collection. biology.burke.washington. Retrieved May 23, 2022, from http://biology.burke.washington.edu/herbarium/imagecollection/taxon.php?Taxon=Spiraea%20lucida

[2]USDA NRCS National Plant Data Team. (2014). *Spiraea lucida* Douglas ex Greene. Plants.usda. Retrieved May 23, 2022, from https://plants.usda.gov/home/plantProfile?symbol=SPLU5

[3]Habeck, R. J. 1991. *Spiraea betulifolia*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Retrieved May 23, 2022, from https://www.fs.fed.us/database/feis/plants/shrub/spibet/all.html

[4]*Spiraea lucida* Douglas ex Greene. (n.d.). Consortium of Pacific Northwest Herbaria. Pnwherbaria. Retrieved May 23, 2022, from https://www.pnwherbaria.org/data/results.php?DisplayAs=WebPage&ExcludeCultivated=Y&GroupBy=ungrouped&SortBy=Year&SortOrder=DESC&SearchAllHerbaria=Y&QueryCount=1&IncludeSynonyms1=Y&SciName1=Spiraea%20lucida&Zoom=4&Lat=55&Lng=-135&PolygonCount=0

[5]Luna, Tara; Corey, Susan; Evans, Jeff; Wick, Dale; Hosokawa, Joy. 2008. Propagation protocol for production of Container (plug) *Spiraea betulifolia* Pallas plants 160 ml conetainers; USDI NPS - Glacier National Park West Glacier, Montana. US Department of Agriculture, Forest Service, National Center for Reforestation, Nurseries, and Genetic Resources. Retrieved May 22, 2022, from https://npn.rngr.net/renderNPNProtocolDetails?selectedProtocolIds=rosaceae-spiraea-200

[6]Wick, Dale; Johnson, Kathy. 2001. Propagation protocol for production of Container (plug) *Spiraea betulifolia* Pallas plants 1.5L containers; USDI NPS - Glacier National Park West Glacier, Montana. US Department of Agriculture, Forest Service, National Center for Reforestation, Nurseries, and Genetic Resources. Retrieved May 22, 2022, from https://npn.rngr.net/npn/propagation/protocols/renderNPNProtocolDetails-PrintFormat

Other Sources Consulted

[7]USDA – Fire Effects Information System. (2022). Feis-crs. Retrieved May 22, 2022, from https://www.feis-crs.org/feis/

[8]Zasada, J.C. and Stickney, P.F. *Spiraea L.* (n.d.). Agriculture Handbook. Fs.fed. Retrieved May 22, 2022, from https://www.fs.fed.us/rm/pubs_other/wo_AgricHandbook727/wo_AgricHandbook727_1067_1070.pdf

[9]*Spiraea betulifolia.* (n.d.). Oregon State University College of Agricultural Sciences – Department of Horticulture. landscapeplants.oregonstate. Retrieved May 22, 2022, from https://landscapeplants.oregonstate.edu/plants/spiraea-betulifolia

[10]*Spiraea lucida* Douglas ex Greene. (n.d.). eFloras. Retrieved May 23, 2022, from https://linnet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Spiraea+lucida

[11]*Spiraea betulifolia* 'Lucida'. (n.d.). University of Florida – Environmental Horticulture. hort.ifas.ufl. Retrieved May 22, 2022, from https://hort.ifas.ufl.edu/database/lppi/sp362.shtml