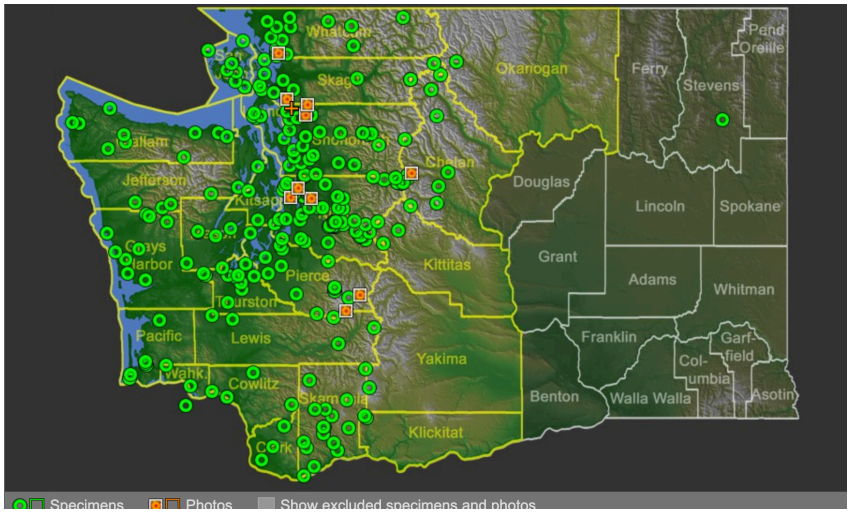
Plant Propagation Protocol for *Rubus spectabilis*

ESRM 412 – Native Plant Production

URL: https://courses.washington.edu/esrm412/protocols/2021/RUSP.pdf\



WTU Herbarium, B., Knocke, D., & Giblin, D. (n.d.). Burke herbarium image collection. Retrieved May 05, 2021, from https://biology.burke.washington.edu/herbarium/imagecollection/taxon.php?Taxon=Rubus+spectabilis

Turner, M. (n.d.). Rubus SPECTABILIS: Salmonberry: Wildflowers of the Pacific Northwest. Retrieved May 05, 2021, from https://www.pnwflowers.com/flower/rubus-spectabilis

TAXONOMY	
Plant Family	
Scientific Name	Rosaceae
Common Name(s)	Rose family
Species Scientific Name	
Scientific Name	*Rubus spectabilis* Prush
Varieties	N/A
Sub-species	N/A
Cultivar	N/A
Common Synonym(s)	N/A
Common Name(s)	Salmonberry, Dewberry, Blackberry (N.C. Cooperative extension, n.d.).

Species Code (as per USDA Plants database)	RUSP
GENERAL INFORMATION	
Geographical range	Maps included above
Ecological distribution	Found in stream banks, west-side forest, and east-side forest; shade tolerant; grows in moist forests, swampy places, stream banks, and other wet areas (Turner 2014, p. 403).
Climate and elevation range	Successful flowering observed from 0-2000 meter elevation (Howell 2016). General elevation range is from sea level to lower alpine elevations, with most abundant growth observed at elevations below 800 meters (Oleskevich 1993, p. 12). Shade tolerate and prefers wet areas (Turner 2014, p. 403).
Local habitat and abundance	Thrive in open areas and spaces under red alder, *Alnus rubra* (Delmatier 2018). Also associated with sitka spruce (*Picea sitchensis*), bigleaf maple (*Acer macrophyllum*), and vine maple (*Acer circinatum*) (Maxwell 1990). Prefers stream margins and especially coastal forests (EMSWCD 2013).
Plant strategy type / successional stage	Ruderal, non-invasive species (Caplan 2013). Early succession, thicket-forming (Turner 2014, p. 403).
Plant characteristics	Strongly rhizomatous thicket-forming perennial. Shrub. Flowers March-July (Howell 2016). 0.90-4.00 cm tall. Leaves palmate, 3-leaflets (Turner 2014 p. 403). Stem prickles near base. Flowers pink to reddish in color. Fruit yellow to orange-pink in color (Bursik 1992). Birds and mammals digest and disperse seeds, enhancing germination. Primarily reproduce vegetatively. Reproduction by seed may be favorable in conditions of high population density. Persist for two or more years (Maxwell 1990).

PROPAGATION DETAILS	
Propagation protocol for production of Rubus spectabilis Prush (Riley 2018)	
Ecotype	Siuslaw National Forest, Oregon; Mt Baker-Snoqualmie National Forest, Washington
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Plug
Stock Type	444 mL container
Time to Grow	18 weeks
Target Specifications	A seedling should be produced with a firm root system in the container, forming a plug
Propagule Collection Instructions	Collect fruits when ripe based on the color by hand, June through August. Store fruit in a plastic bag at 4°C until extraction. Extraction should take place within two weeks of picking the berries in order to avoid mold growth.
Propagule Processing/Propagule Characteristics	Macerate berries in bag with a 3:1 ratio of water to berry mixture. Transfer mixture to a beaker. Add a tablespoon of pectinase per liter, stir, and leave at room temperature for 24 hours. After 24 hours, pour off the top layer while continually mixing gently. This is to clean the seeds that are at the bottom of the beaker. When the seeds are cleaned, pour onto a towel and allow to dry. Any remaining debris can be removed with tweezers. Store at 4°C.
Pre-Planting Propagule Treatments	Seeds should be sowed into trays filled with Q-plugs. After seeds have been sowed, the trays are sealed in plastic bags. These plastic bags are refrigerated at 1-3°C for 120 days. Trays should be checked weekly for moisture maintenance and treatment for mold. If mold is observed, trays should be treated with 1% hydrogen peroxide solution.

Growing Area Preparation / Annual Practices for Perennial Crops	Grown in a greenhouse facility. Q-plugs are lightly covered. After 3 weeks of stratification, the seedlings and transferred to the target containers. Growing medium used is 40:20:20:20 peat:composted fir bark:perlite:pumice with Apex controlled release fertilizer (16N:5P2O5:10K2O with minors; 6 to 7 month release rate at 21C) at the rate of 2 gram Apex per 444 ml container.
Establishment Phase Details	Germination typically completes within 2 weeks. Following germination, but before transfer of the seedlings, plants are fertilized with soluble 12-2-14-6Ca-3Mg at 75 to 100 ppm for 2 weeks.
Length of Establishment Phase	2-3 weeks
Active Growth Phase	Rapid growth following establishments. Top-pruning may be necessary, or the plants may have to be spaced apart in racks after 3 months. Soluble fertilizer (20-9-20 NPK, 20-18-18 NPK, or 17-5-24 NPK) at 100 to 150 ppm is applied weekly throughout the growing season.
Length of Active Growth Phase	15 weeks
Hardening Phase	Seedlings are moved to a growing facility outdoors from the greenhouse in September. There is no dry-down done.
Length of Hardening Phase	2-3 weeks
Harvesting, Storage and Shipping	Harvesting takes place in mid-late October. Always stored in outdoor growing area. Shipping happens with the plants in their current containers with irrigation taking place before shipment.
Length of Storage	Minimal/none, containers
Guidelines for Outplanting / Performance on Typical Sites	N/A
Other Comments	N/A
Propagation protocol for production of Rubus spectabilis Prush (Young 2001)	
Ecotype	Tennessee Valley, California

Propagation Goal	Plants
Propagation Method	Vegetative
Product Type	Plug
Stock Type	Deepot 40
Time to Grow	N/A
Target Specifications	Firm root system forming a plug in container
Propagule Collection Instructions	Collect hardwood cuttings Nov-Jan. Cutting length: 10 - 12 inches with a diameter of 3/8 to 1/2 inch including at least 8 nodes.
Propagule Processing/Propagule Characteristics	Keep cuttings cool and moist before treatment begins.
Pre-Planting Propagule Treatments	Cuttings are first dipped in a mild bleach solution for 30 seconds. Cuttings are recut to 4 inch lengths including 3 nodes each. Cuttings are treated with Hormex (3000 ppm IBA) rooting powder and struck in flats containing 3:1 perlite/vermiculite. 100 Cuttings are struck 2 inches deep per flat.
Growing Area Preparation / Annual Practices for Perennial Crops	Fully Controlled Greenhouse. Watered with an automatic misting system until roots are fully developed.
Establishment Phase Details	Cuttings are transplanted to individual containers and placed in a shade-house after 50 days. Transplant survival rate = 50%.
Length of Establishment Phase	50 days
Active Growth Phase	Rapid growth following establishments. Top-pruning may be necessary, or the plants may have to be spaced apart in racks (Riley 2018).
Length of Active Growth Phase	15 weeks (Riley 2018).
Hardening Phase	Begins in September as temperatures cool (Riley 2018).
Length of Hardening Phase	2-3 weeks (Riley 2018)

Harvesting, Storage and Shipping	Harvesting takes place in mid-late October. Always stored in outdoor growing area. Shipping happens with the plants in their current containers with irrigation taking place before shipment (Riley 2018).
Length of Storage	Minimal/none, containers.
Guidelines for Outplanting / Performance on Typical Sites	Plant in 5 cm x 25 cm tube containers (Deepot 40) containing standard potting mix of peat moss, fir bark, perlite, and sand. Plant with 2.5 meter spacing.
Other Comments	N/A
INFORMATION SOURCES	

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pdf of original protocol: http://courses.washington.edu/esrm412/protocols/2007/RUSP.pdf