Template - Plant Propagation Protocol
ESRM 412 – Native Plant Production
JD Bakker
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Updated by JD Bakker on 070418

This template is modified from that available at:
http://www.nativeplantnetwork.org/network/SampleBlankForm.asp

TAXONOMY	
Family Names	
Family Scientific Name:	Rosaceae
Family Common Name:	Rose family
Scientific Names	
Genus:	*Rubus*
Species:	*spectabilis*
Species Authority:	Prush
Variety:	N/A
Sub-species:	N/A
Cultivar:	N/A
Authority for Variety/Sub-species:	N/A
Common Synonym(s)	
Genus:	*Rubus*
Species:	*spectabilis*
Species Authority:	Prush
Variety:	N/A
Sub-species:	N/A
Cultivar:	N/A
Authority for Variety/Sub-species:	N/A
Common Name(s):	Salmonberry
Species Code (as per USDA Plants database):	RUSP
GENERAL INFORMATION	
General Distribution (geographical range (states it occurs in), ecosystems, etc):	R. spectabilis is found along the coast of Alaska all the way to Central California and as fare east as Montana and Idaho. Salmonberries are fairly shade tolerant, found in riparian forests, river terraces, seeps, and swamps. It also forms in clearings (Tirmenstein 1989).
Climate and elevation range	Found in mid to low elevations, (below 305 meters in California, below 400 meters in Washington). It prefers moist woods, and mesic sites (Tirmenstein 1989).
Local habitat and abundance; may include commonly associated species	Rubus spectabilis if found thick in Washington in both logged areas and in undamaged riparian areas (Sumampong 1999).

Plant strategy type / successional stage (stress-tolerator, competitor, weedy/colonizer, seral, late successional)	Early succession, stress-tolerate, competitor, colonizer (Sumampong 1999).
PROPAGATION DETAILS	
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.))	Container (Plug)
Stock Type:	Deepot 40
Time to Grow (from seeding until plants are ready to be outplanted):	N/A
Target Specifications (size or characteristics of target plants to be produced):	Height: N/A Root System: Firm in plug container (Young 2001).
Propagule Collection (how, when, etc):	Hardwood cuttings should be collected between early November to the end of January. Cutting length: 10 - 12 inches with a diameter of 3/8 to 1/2 inch including at least 8 nodes, (Young 2001).
Propagule Processing/Propagule Characteristics (including seed density (# per pound), seed longevity, etc):	Cuttings need to be kept cool and moist prior to treatment, and should be out planted soon after harvested (Leigh 1999).
Pre-Planting Propagule Treatments (cleaning, dormancy treatments, etc):	Cuttings should be dipped in a mild bleach solution for 30 seconds. Cuttings should then be re-cut to 4-inch lengths with at least 3 nodes each. Cuttings should then be treated with Hormex (3000 ppm IBA) rooting powder and struck in flats containing 3:1 perlite/vermiculite. 100 Cuttings should be struck 2 inches deep per flat. % Rooting:50% (Young 2001).
Growing Area Preparation / Annual Practices for Perennial Crops (growing media, type and size of containers, etc):	2”x10” tubes (Deepot 40) using standard potting with a mix of peat moss, perlite, sand, and fir bark. (Young 2001).
Establishment Phase (from seeding to germination):	Planting Method: Transplanting Cuttings. Time to Transplant: 50 days. Cuttings need to be transplanted to individual containers and placed in a shade-house. (Young 2001).

	Transplant Survival averages 50% (Young 2001).
Length of Establishment Phase:	50 days.
Active Growth Phase (from germination until plants are no longer actively growing):	Keep in Fully Controlled Greenhouse and water with an automatic mist system until roots are fully developed (Young 2001)
Length of Active Growth Phase:	Eairly spring to late summer (Sumampong 1999)
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):	As temperatures cool and rain increases plants begin to harden for winter temperatures. (Sumampong 1999)
Length of Hardening Phase:	Late summer to early fall (Sumampong 1999)
Harvesting, Storage and Shipping (of seedlings):	Seeds should be stored in a cold temperatures of 5 degrees C. (Rose et al, 1998)
Length of Storage (of seedlings, between nursery and outplanting):	If seeds are dried they can be stored up to three years (Rose et al, 1998)
Guidelines for Outplanting / Performance on Typical Sites (eg, percent survival, height or diameter growth, elapsed time before flowering):	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 (Young, 2001)
Other Comments:	Salmonberries are edible and have many medicinal properties, in the back of the cambia layer. (Sumampong 1999). *Didymella applanata* is a potential biological control agent for *R spectabilis*.
INFORMATION SOURCES	
References:	Rose, Robin, Caryn E.C. Chachulski and Diane L. Haase. 1998. Propagation of Pacific Northwest Native Plants. Oregon State University Press, Corvallis, OR. 248 p. Sumampong, G. 1999. Genetic Diversity and Potential Biological Control of Rubus spectabilis. Department of Biological Sciences Thesis. 2005. Tirmenstein, D. A. 1989. Rubus spectabilis. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (2003, March). Fire Effects Information System, [Online]. Available: http://www.fs.fed.us/database/feis/ [accessed April 14, 2003] Young, Betty. 2001. Propagation protocol for

	vegetative production of container Rubus spectabilis Pursh plants (Deepot 40); Golden Gate National Parks, San Francisco, California. In: Native Plant Network. URL: http://www.nativeplantnetwork.org (accessed 25 April 2007). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery.
Other Sources Consulted (but that contained no pertinent information):	Traveset, A. 2004. Ecology of the fruit-color polymorphism in Rubus spectabilis. Evolutionary Ecology volume 12 1998.
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Date Entered or Updated (MM/DD/YY):	4/25/2007

Species:
Salmonberry, *Rubus spectabilis*

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Range:
Pacific Northwest region from Santa Cruz County California, north to Alaska, east to Idaho and Montana
(Tirmenstein, 1989)

Climate, elevation:
Cool temperate regions, low to middle elevation (below 305 meters in California, below 400 meters in Washington)
(Tirmenstein, 1989)

Local occurrence:
Common, more often found west of Cascades (Tirmenstein, 1989)

Habitat preferences:
Mesic sites. Fairly shade tolerant, also found in clearings. Riparian forests, river terraces, seeps, and swamps (Tirmenstein, 1989)

Plant strategy type/successional stage:
Ruderal, can colonize disturbed areas after fire, logging or other disturbance type by seed or by rhizomes / most often early seral stage (Franklin and Dyrness, 1988), can tolerate mature deciduous forest understory (Tirmenstein, 1989)

Associated species:
Alnus rubra, Populus trichocarpa, Tsuga heterophylla,
Maianthemum dilatatum, Polystichum munitum (Tirmenstein, 1989, Franklin and Dyrness, 1988)

May be collected as:
Seed, Salvaged if young and/or small <4' tall, Layered, or Cut to produce offshoots from root crown, (Leigh, 1999)
Semi-hardwood cuttings (Young, 2001)

Collection restrictions or guidelines:
Seed ripens June through August in Washington, (Rose et al, 1998) it is ripe when fruit is red, yellow or orange and soft. (Tirmenstein, 1989)

Seed germination:
Hard seed coat requires mechanical or chemical (sulfuric acid or 1% sodium hyperchlorite solution) scarification for 20-60 minutes, seven days prior to cold stratification. (Rose et al, 1998)
Dormant embryo requires stratification, first warm at 20-30 degrees C for 90 days, then cold at 2-5 degrees C for additional 90 days. (Leigh 1999) Or sow in fall for best germination. (Rose et al 1998)

Seed life:
Dried seed can be stored several years (Rose et al, 1998)

Recommended seed storage conditions:
5 degrees C. (Rose et al, 1998)

Propagation recommendations:
Can reproduce sexually or asexually. Produces seed with or without pollination (apomictic), on two year old or older stems.
Sprouts easily from rhizomes, root crown, or stump. Layers from aerial canes (Tirmenstein, 1989)
Easily grown from root cuttings (Leigh 1999)

For propagating by seed according to Rose et al (1998):
Macerate fruit in water and float off pulp and empty seed
Dry seed
Follow germination requirements above

The following protocol for cuttings is from, Young, (2001) working in California:

Hardwood cuttings are collected between November 1st and January 31st.
Cutting diameter, 1.2 cm Cutting length, 25 cm with min. 8 nodes
Cuttings kept moist and cool prior to treatment
Cuttings dipped in a mild bleach solution for 30 seconds
Cuttings recut to 10 cm and min 3 nodes
Cuttings treated with Hormex (3000 ppm IBA) rooting powder and struck 100/flat, 5cm deep in 3:1 perlite/vermiculite
Flats in greenhouse and watered with automatic mist until roots develop.
Cuttings grown for 50 days then transplanted to 5 cm x 25 cm tubes (Deepot 40) with standard potting mix
~50% rooting

Soil or medium requirements:

3:1 Perlite/Vermiculite (Young, 2001)

Installation form:

5 cm x 25 cm tube containers (Deepot 40) containing standard potting mix of peat moss, fir bark, perlite, and sand.
Transplant Survival averages 50%. (Young, 2001)

Recommended planting density:

2.5 meters

Care requirements after installed:

Water once every 2-3 weeks during first summer following transplanting, unless site has adequate summer soil moisture

Normal rate of growth or spread; lifespan:

Fast. Grows to 1-3 meters tall. (Rose et al, 1998)

Sources cited:

Franklin, Jerry and C.T. Dyrness. 1988 Natural Vegetation of Oregon and Washington. Oregon State University Press, Corvalis, OR 452 p.

Leigh, Michael. 1999. Grow your Own Native Landscape A Guide to Identifying, Propagating & Landscaping with Western Washington Native Plants. Native Plant Salvage Project WSU Cooperative Extension-Thurston County Olympia, WA. 116 p.

Rose, Robin, Caryn E.C. Chachulski and Diane L. Haase. 1998. Propagation of Pacific Northwest Native Plants. Oregon State University Press, Corvallis, OR. 248 p.

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