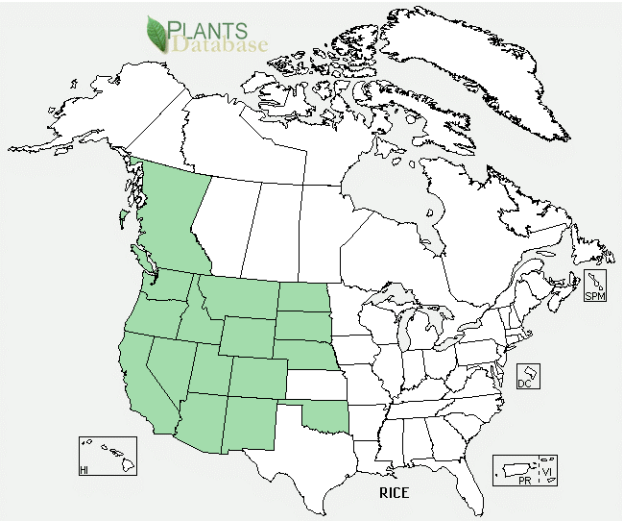
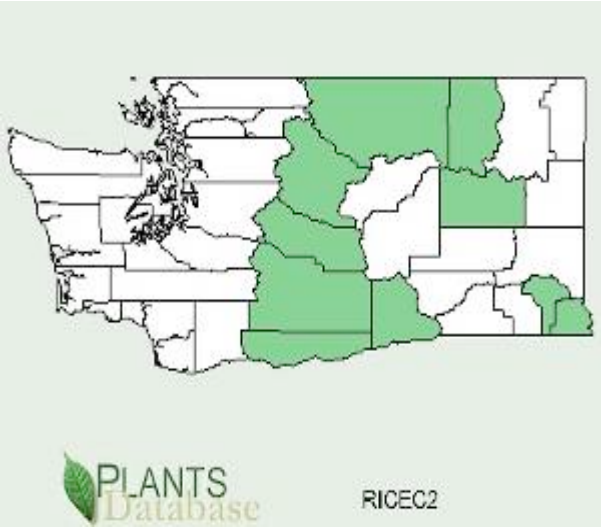
Plant Propagation Protocol for *Ribes cereum*

ESRM 412 – Native Plant Production





TAXONOMY	
Family Names	
Family Scientific Name:	Grossulariaceae
Family Common Name:	Currant Family Gooseberry Family
Scientific Names	
Genus:	*Ribes*
Species:	*cereum*
Species Authority:	Douglas
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)	*Ribes cereum var. cereum* *Ribes cereum var. colubrinum* C.L. Hitchc. *Ribes cereum Douglas var. pedicellare* Brewer & S. Watson
Common Name(s):	wax currant, whiskey currant, western red currant, squaw currant, gooseberry [7]
Species Code (as per USDA Plants database):	RICE RICEC2 RICEC RICEP
GENERAL INFORMATION	
Geographical range	W. North America - Common east of the Cascades, British Columbia to Oregon; also, California east to Nebraska. See maps above for distribution maps for

	North America and Washington state. Rare in Oklahoma; restricted to northwestern Cimarron County. [9]
Ecological distribution (ecosystems it occurs in, etc):	Ribes cereum occurs in open, coniferous forests, at forest edges, and in mountain shrub communities. [5] It can also be found in thickets, rocky areas, sagebrush deserts, and sub alpine ridges. Prefers rocky/gravelly soil that drains well
Climate and elevation range	Full sun to part shade, low to moderate water. Minimum of 330mm precipitation/year. Elevation between 1500m and 4000m.
Local habitat and abundance; may include commonly associated species	Ribes cereum is listed as imperiled to critically imperiled in the state of Washington.[2] In some counties in Washington, it is no longer grown. See map above for details. Berries are favorites among birds. Provides cover for a variety of wildlife.[8]
Plant strategy type / successional stage	Shade from their crowns shelters conifer seedlings that fall from fruit and aids forest succession. Begins to establishes after light ground scarification, and thrives after thorough scarification which starts germination. Plant itself is shade intolerant. Grows most vigorously on sites without forest canopy.
Plant characteristics (life form (shrub, grass, forb), longevity, key characteristics, etc)	General: Spreading or rounded shrub from 0.5m – 1.5m tall. New branches are sticky and finely pubescent then turn grayish-brown to reddish-brown. Leaves: Simple, Alternate, fan-shaped, commonly shallowly 3 or 5 lobed with rounded teeth, and fine pubescents. Fruit: Bright red, orange, or yellowish, waxy, round berries (6-7mm) with several seeds Flowers: 0.5in, greenish white to pink, 5 sepals and 5 erect petals, hanging grouped from 1 to 8 flowers.[4] Berries are tasteless. [10]
PROPAGATION DETAILS: Oregon	
Ecotype (this is meant primarily for experimentally derived protocols, and is a description of where the seed that was tested came from):	Crater Lake National Park; on open ridges and slopes with rabbitbrush, manzanita; dry meadows at 5,500 to 6,000 feet elev.[1]
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.))	Container (plug)
Stock Type:	1-gallon containers
Time to Grow (from seeding until plants are ready to be outplanted):	2 years
Target Specifications (size or characteristics of target plants to be produced):	Multiple-stemmed, branched tops, with well-developed root system filling containers. Consolidated roots sufficient enough o prevent root ball disintegration during out-planting.[1]
Propagule Collection (how, when, etc):	Red berries containing numerous seeds ripen from July to August. Collected in August; hand picked into plastic bags and kept in a cooler for transport. Seeds require 4 to 5 months of cold stratification (near 3-5 C) after which they can be planted in the spring.[1]
Propagule Processing/Propagule Characteristics (including seed density (# per pound), seed longevity, etc):	Depulped in water in a blender with dulled blades; pour off pulp then strain seeds and spread on paper toweling to dry. One lb berries yielded about 70 grams seed; seed weights average 201,400 to 283,600 / lb.[1] Under normal storage conditions the seed can remain viable for 17 years or more.[1]
Pre-Planting Propagule Treatments (cleaning, dormancy treatments, etc):	Seeds are soaked 4 hours in 3% hydrogen peroxide and then stratified for 120 days at 3 to 5 C. The acid improves the stratification process[1]
Growing Area Preparation / Annual Practices for Perennial Crops (growing media, type and size of containers, etc):	Seedlings started on greenhouse bench when stratification was complete, transplanted into 3.5" square pots filled with Fisons Sunshine #1 soil-less potting mix with about 10% extra perlite. Monitored new growth for aphids; treated with Safers' insecticidal soap when necessary[1]
Establishment Phase (from seeding to germination):	Kept in poly greenhouse until mid to late May; then moved outdoors to a shade-house for summer. Plants also did well in full sun but pots should be kept shaded to keep roots cool. Many were ready for repotting into 1-gallon cans in June of 1st year. 1-gallon cans held in shade-house, on raised open benches to allow for air-pruning of roots and good drainage.[1]
Length of Establishment Phase:	6 to 10 weeks
Active Growth Phase (from germination until plants are no longer actively growing):	Plants were fertilized at 2 to 3 week intervals with Peters 9-45-15 starter fertilizer at half strength for the first two fertilizations; then with Peters' Triple 20 at 2 week intervals until July. Plants maintained with drip irrigation system, which helped to keep foliar diseases

	down. New growth headed back in early June if needed to control top growth and encourage branching.[1]
Length of Active Growth Phase:	May to July
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):	Plants flushed with water in July to reduce excess salt build-up in pots; fertilization ceased and watering intervals lengthened in August to encourage vegetative maturity. Shade cloth removed in September to allow full sun acclimation.[1]
Length of Hardening Phase:	August - September
Harvesting, Storage and Shipping (of seedlings):	Plants held over winter in unheated poly greenhouse; repotted and shoot / root pruned if necessary following spring. Transported in August via refrigerated van to Crater Lake to a holding facility near park headquarters for a few weeks acclimation prior to outplanting in September around refurbished lodge.[1]
Length of Storage (of seedlings, between nursery and outplanting):	Seeds - length of storage not known but older lots did require longer stratification to break dormancy.[1]
Guidelines for Outplanting / Performance on Typical Sites (eg, percent survival, height or diameter growth, elapsed time before flowering):	Well-developed root systems required root scoring at planting time. Plants survived well over first winter or outplanting at Lodge.[1]
PROPAGATION DETAILS	
Ecotype (this is meant primarily for experimentally derived protocols, and is a description of where the seed that was tested came from):	Lone Peak Conservation Nursery: State of Utah
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 (field grown)
Stock Type:	1+0
Time to Grow (from seeding until plants are ready to be outplanted):	1 year
Target Specifications (size or characteristics of target plants to be produced):	Height: 8 in. Caliper: 3/16 in. Root System: Root system must balance top growth.[3]
Propagule Collection (how, when, etc):	Seeds are wild collected during fall months and are kept separated according to site, elevation and source.[3]
Propagule Processing/Propagule	Seeds are cleaned prior to storage and kept in air tight

Characteristics (including seed density (# per pound), seed longevity, etc):	containers in a seed storage room at temperatures below freezing.[3]
Pre-Planting Propagule Treatments (cleaning, dormancy treatments, etc):	Seeds are stratified naturally by planted them in the fall in a thin layer of sand on mulched field beds.[3]
Growing Area Preparation / Annual Practices for Perennial Crops (growing media, type and size of containers, etc):	Soils: Our field soils are Taylorsville Sandy clay loam with Cca horizon shallower than 12", Taylorsville sand clay loam variant with Cca deeper than 12",Taylorsville Clay loam variant with Cca horizon shallower than 12" and Taylorsville Clay loam variant with Cca horizon deeper than 12". Field Bed Preparation: We mark out and form beds as needed; and apply 0-45-0 (N:P:K) in April. 2 to 3 inches of compost are applied to seed beds prior to sowing. Sulfur is applied during May. Fields are cultivated for weeds as needed throughout the growing season. Irrigation: We use overhead irrigation with two inch aluminum pipe that can be moved from field to field each year. Our principle water source is from a canyon stream to the north of here and is very good quality water.[3]
Establishment Phase (from seeding to germination):	Seeds are sown in mid September using an Oyjard seed drill at a depth of 0.12 inches. Seeds are lightly covered and irrigated when soils appear to be drying out on warm days. Desired field density is 30 shrubs per square foot.[3]
Length of Establishment Phase:	1 month after emergence in the spring
Active Growth Phase (from germination until plants are no longer actively growing):	Year 1: Fertilization: We apply Morgro 21-0-0 (N:P:K) with the Gandy spreader (setting 18, speed 2 mph, rpm 1100 to 1200) the second week of each month during the growing season; from April to August. We apply fertilizer at the rate of 120 lbs/acre. We irrigate for at least 45 minutes following all fertilizer applications. This insures that foliage will not burn and incorporates fertilizer into the root zone. Fertilizer is not applied when foliage is wet. All sulfur and 0-45-0 (N:P:K) applications must be mechanically incorporated since these amendments are not mobile in the soil. ROOT PRUNING PROCEDURES: Deciduous species are pruned when they are 10 inches tall. Irrigate heavily for 2 to 3 days prior to pruning to saturate the root zone. Set pruning blade to slightly wrench seedlings as they are pruned. Check pruning depth frequently and adjust as needed. Irrigate for a minimum of 2 hours following root pruning to settle soil back around roots. This step

	is critical to eliminate post root pruning mortality. Irrigate field heavily for 2 to 3 days to further settle the soil. Top Pruning: Top pruning is typically done with sickle bar mower attached to the 656. Operational speed varies, but is not done above 1200 rpm. Cut at the desired height; constantly checking and adjusted the cut during the process. Keep field workers behind the cutting head.growth and encourage branching.[3]
Length of Active Growth Phase:	May to July
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):	Plants flushed with water in July to reduce excess salt build-up in pots; fertilization ceased and watering intervals lengthened in August to encourage vegetative maturity. Shade cloth removed in September to allow full sun acclimation.[3]
Length of Hardening Phase:	2 months
Harvesting, Storage and Shipping (of seedlings):	Lifting window is during early spring(early February to mid March) when seedlings are completely dormant. Seedlings are hand lifted after the seedling beds have been undercut at a depth of 8 inches using a lifter. They are stored in our cooler on stacked pallets. We keep lifted seedlings in our cooler at between 36 to 42 degrees F and at a relative humidity of 92 to 98% with good air circulation.[3]
Length of Storage (of seedlings, between nursery and outplanting):	Seeds - length of storage not known but older lots did require longer stratification to break dormancy.[3]
Guidelines for Outplanting / Performance on Typical Sites (eg, percent survival, height or diameter growth, elapsed time before flowering):	Well-developed root systems required root scoring at planting time. Plants survived well over first winter or outplanting at Lodge.[3]
Other Comments (including collection restrictions or guidelines, if available):	Cuttings also successful; hardwood cuttings collected in October, treated with 0.8% IBA and held in mist bench rooted by January.[3]
INFORMATION SOURCES	
References (full citations):	See below
Other Sources Consulted (but that contained no pertinent information) (full citations):	
Protocol Author (First and last name):	Joey Shaughnessy
Date Protocol Created or Updated (MM/DD/YY):	04/18/2012

References

1. "Native Plant Network." Protocol Information. N.p., n.d. Web. 18 Apr 2012. <http://www.nativeplantnetwork.org/Network/ViewProtocols.aspx?ProtocolID=2476>.

[2] Hebert, Jack. "Native Plant Workbook Index Page." Plant Data Sheet. N.p., 12/04/2006. Web. 18 Apr 2012. <http://depts.washington.edu/propplnt/Plants/Ribes cereum.htm>.

[3] Trimmer, Edie. "Native Plant Network." Protocol Information. N.p., 2006. Web. 18 Apr 2012. <http://www.nativeplantnetwork.org/Network/ViewProtocols.aspx?ProtocolID=2737>.

[4] Sexton, Hollie. "The University of Montana - Missoula." Northern Rockies Natural History Guide. N.p., 08/01/2004. Web. 18 Apr 2012. <http://nhguide.dbs.umt.edu/index.php?c=plants&m=desc&id=251>.

[5] Marshall, K. Anna. 1995. Ribes cereum. 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/ [2012, April 18].

[6]. "Burke Museum of Natural History and Culture." Ribes cereum. N.p., n.d. Web. 18 Apr 2012. <http://biology.burke.washington.edu/herbarium/imagecollection.php?Genus=Ribes&Species=cereum>.

[7]. "Natural Resources Conservation Service." *Plants Profile*. N.p., n.d. Web. 18 Apr 2012. <http://plants.usda.gov/java/profile?symbol=RICE>.

[8]. "The University of Texas at Austin." Native Plant Database. N.p., n.d. Web. 18 Apr 2012. <http://www.wildflower.org/plants/result.php?id_plant=RICE>.

[9]. "Bio Survey." Ribes cereum Dougl.. N.p., 09/17/1999. Web. 18 Apr 2012. <http://www.biosurvey.ou.edu/shrub/ribe-cer.htm>.

[10]. "SEINet." Ribes cereum Dougl.. N.p., n.d. Web. 18 Apr 2012. <http://swbiodiversity.org/seinet/taxa/index.php?taxon=2984>.