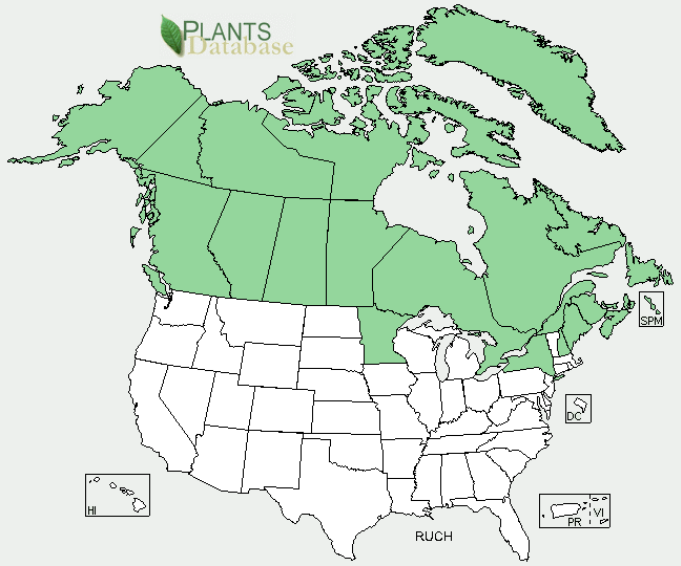
Plant Propagation Protocol for *[Rubus chamaemorus]*
ESRM 412 – Native Plant Production
Protocol URL: https://courses.washington.edu/esrm412/protocols/[*RUCH.pdf]*



TAXONOMY	
Plant Family	Rosaceae
Scientific Name	Rubus Chamaemorus L.
Common Name	Cloudberry
Species Scientific Name	
Scientific Name	Rubus chamaemorus L.
Varieties	No information
Sub-species	No information
Cultivar	No information
Common Synonym(s)	
Common Name(s)	Cloudberry, Bakeapple, Bakeapple Berry
Species Code (as per	RUCH

USDA Plants database)	
GENERAL INFORMATION	
Geographical range	North America from Alaska south to British Columbia and east to Newfoundland and New York (Baskin & Baskin 2002). Also see map above protocol (USDA Plants).
Ecological distribution	Found in sphagnum bogs and peaty soil from the lowlands to montane zones. Circumboreal species. Grows in organic but relatively dry soil with sandy subsoils (Baskin & Baskin 2002). Found in cool boggy environments, on hills and mountains. (http://www.pfaf.org/ 2012). Grows well in sandy, loamy, and clay soils and prefers well-drained soil. It can also grow in very acid soils. It cannot grow in the shade. It prefers moist or wet soil. (http://www.pfaf.org/ 2012). The most favorable growing conditions are obtained on peat bogs between 0.5 and 1 meter in depth, with pH-values between 3.5 and 4.5, and with the ground water 40 to 50 cm below the surface (Rapp et al. 1993). Can tolerate minimum temperature of -38 degrees F. Grows in soil of pH between 4 and 5.2 (USDA Plants).
Climate and elevation range	Mostly low elevation bogs (Pojar & Mackinnon 1994), but also may grow in montane areas (Baskin & Baskin 2002).
Local habitat and abundance	Dominant or co-dominant in dwarf-shrub bogs/muskegs (http://www.osrin.ualberta.ca/en/Resources/). Often associated with bilberries and spruce. (http://www.pfaf.org/ 2012), (USDA Plants).
Plant strategy type / successional stage	Pioneer species (Rapp et al. 1993). Facultative seral species (Coladonato 1993).
Plant characteristics	Unarmed perennial herbaceous shrub, forb (Pojar & Mackinnon 1994). It is diecious and uses mainly vegetative propagation in the form of a rhizome to self-propagate using subterranean runners to sprout buds about 10 cm below the surface

	(Rapp et al. 1993). Shoots from rhizome are produced annually and stem 15-25 cm above the ground. These shoots may have leaves or produce single flowers (http://www.pfaf.org/ 2012). Sometimes entire patches of Rubus chamaemorus can contain only females or males flowers, thus it is possible for large spans to produce no fruit (NRCS 2006). Produces a berry with multiple drupelets with nut seeds. (Rapp et al. 1993) Seeds are very thick ~ 0.238mm, and have a hardness rating of 5 (Reed & Wada 2011). Evidence of amygdalin, in the seed coat, which prevents seed germination (Warr et al. 1979). Plants exhibit variability depending on location and have long shoots and large leaves at shady sites, but short shoots and small leaves in open areas (Thiem 2003). Prickly, 10-30 cm tall, stems have one to three leaves. Flowers are solitary and have five petals. They bloom around July and fruit in August (http://www.osrin.ualberta.ca/en/Resources/). Pollinated by insects such as bumblebees, solitary bees and different species of flies. Plants in coastal areas also depend on wind pollination (NRCS 2006).
PROPAGATION DETAILS	
Ecotype	No information
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Container (plug)
Stock Type	No information
Time to Grow	No information
Target Specifications	No information
Propagule Collection Instructi	Collect in late August or early September. Pick berries by hand, collect into containers and store at low temperatures until cleaning (http://www.osrin.ualberta.ca/en/Resources/).

ons	It may be difficult to plan ahead in fruit collection, as whole patches can produce all male or female flowers. To ameliorate this, we can examine flowers to determine which plants will produce fruit. Male flowers open before female flowers and have nectar (NRCS 2006). Also, few seedlings are found in wild stands (NRCS 2006).
Propagule Processing/Propagule Characteristics	The berry yield level on native peat-land is 20 to 50 kg/ha (8 to 20 kg/acre). (Rapp et al. 1993) After 7 years of storage, Rubus chamaemorus had 80% viability (Reed & Wada 2011).
Pre-Planting Propagule Treatments	Separate seed from pulp in blender. Store seeds in cold temperatures at low humidity (http://www.osrin.ualberta.ca/en/Resources/). Scarification for at least 3h in H_2SO_4, may take 4-6h to break the seed coat, but over 5 hours has the potential to damage the seed (Reed & Wada 2011). Scarification in one percent solution of sodium hyperchlorite for seven days to break down the seed coat (Gorman 2005). Then put in a stratification media of three parts peat moss and one part sand. Stratification for 90 days warm, moist treatment followed by 90 days cold, moist conditions (Gorman 2005). If seed is going to be sown in late summer or early fall, only the scarification needs to be performed (Gorman 2005). Seeds require acid scarification plus six to eight months of cold stratification to germinate (NRCS 2006). Cold moist stratification for 270 days breaks dormancy. Cold stratified seeds germinate at 18 degrees C. (Baskin & Basking 2002).
Growing Area Preparation / Annual Practices for Perennial Crops	No information
Establishment Phase	Seedlings transplanted 6 weeks when first true leaves form (Gorman 2005).

Details	
Length of Establishment Phase	No information
Active Growth Phase	No information
Length of Active Growth Phase	No information
Hardening Phase	Seedlings can be over-wintered in raised beds and in cold-frames (Gorman 2005).
Length of Hardening Phase	No information
Harvesting, Storage and Shipping	No information
Length of Storage	No information
Guidelines for Outplanting / Performance on Typical Sites	Fruit production does not begin until seven years after seed germination (Gorman 2005).
Other Comments	Roots have been used for coughs, fever, and consumption. Berries are high in Vitamin C and have been used in pies and other forms of consumption (USDA Plants).
INFORMATION SOURCES	
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Previous protocol from 2003: http://depts.washington.edu/propplnt/Plants/Cloudberry.htm