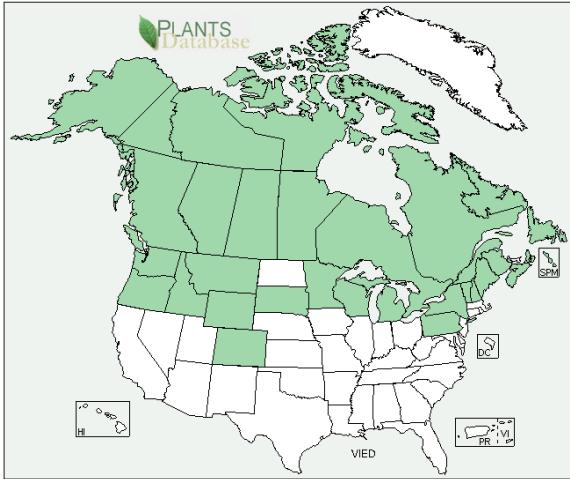
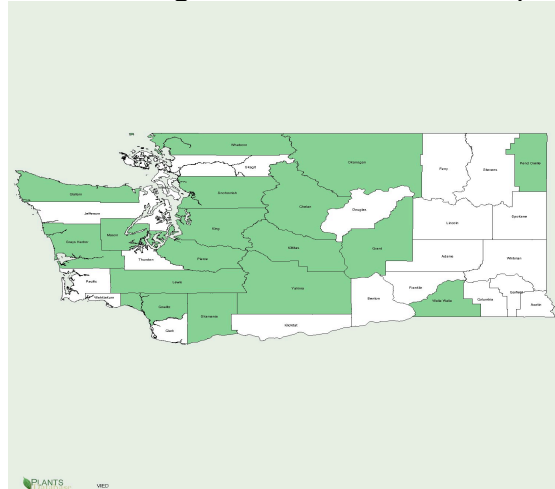


Plant Propagation Protocol for *Viburnum edule*
 ESRM 412 – Native Plant Production

North America Distribution Map



Washington State Distribution Map



Source: USDA PLANTS Database ¹⁵

TAXONOMY	
Family Names	
Family Scientific Name:	Caprifoliaceae ^{2, 5, 6, 12, 13, 15} Note: Some people and groups have now classified Viburnums under Adoxaceae instead of Caprifoliaceae ²
Family Common Name:	Honeysuckle Family ¹³
Scientific Names	
Genus:	<i>Viburnum</i>
Species:	<i>Edule</i>
Species Authority:	(Michx.) Raf.
Variety:	N/A
Sub-species:	N/A
Cultivar:	N/A
Authority for Variety/Sub-species:	N/A
Common Synonym(s)	VIPA11 <i>Viburnum pauciflorum</i> La Pylaie ex Torr. & A. Gray ^{5, 6, 15} <i>Viburnum opulus</i> var. <i>edule</i> Michx. ⁶ <i>Viburnum acerifolium</i> Bong. ⁶
Common Name(s):	Highbush Cranberry ^{4, 5, 6, 7, 9, 10, 11, 12, 14} Squashberry ^{2, 4, 6, 9, 10, 15} Mooseberry ^{2, 4, 6, 9, 10, 15} Lowbush Cranberry ⁶ Few-flowered Highbush Cranberry ⁶
Species Code:	VI ED ¹⁴
GENERAL INFORMATION	

Geographical range	<p>USA (AK, CO, ID, ME, MI, MN, NH, NY, OR, PA, SD, VT, WA, WI, WY) ¹⁵ CAN (AB, BC, LB, MB, NB, NF, NS, NT, NU, ON, QC, SK, YT) ¹⁵ FRA (St. Pierre and Miquelon) ¹⁵</p> <p>Listed as endangered in WI, threatened in MI, NY, VT and a species of special concern in ME ¹⁴</p>
Ecological distribution	<p>Moist forests and forest edges, thickets, rocky slopes, margins of wetlands, stream banks, river terraces, swamps, and rocky shorelines (in Alaska) ^{4, 8, 9, 10, 11}</p> <p>Often found in moist, well drained soils under hardwoods or mixed hardwood and softwoods ¹¹</p>
Climate and elevation range	<p>Found from low to medium elevations (i.e. sea level to 5,000 feet) ^{8, 9, 10, 11} in shady to semi-shady sites ^{2, 11}</p> <p>Grows in hardiness zones 3b-9a ¹⁰</p>
Local habitat and abundance	<p>For the pacific northwest it is relatively infrequent in the moist woods and swamps on both sides of the Cascades. ⁴</p>
Plant strategy type / successional stage	<p>No information available</p>
Plant characteristics:	<p>Perennial shrub ¹⁵</p> <p>General Characteristics: Straggling or erect, grows 0.5-3.5m tall with smooth reddish to grey bark, multi-stemmed~ 4 cm in diameter. Spreads via rhizomes, layering, and seed. ^{2, 7, 8, 9, 11,}</p> <p>Leaves: Deciduous, opposite, 2-4 inches long and wide, ovate to obovate in shape, serrated, shallowly 3-lobed at apex, palmately veined from the base with 3-5 vein pairs, glandular under side. Green to dark green in spring and summer and turns crimson in the fall. ^{2, 7, 8, 9, 10, 11, 13}</p> <p>Flowers: white, 1-3 cm wide, flat-topped, possessing 5 petals and 5 stamens. The ovary is inferior, 3 celled. Blooms from late spring (May) to mid summer (June or July) and occurs in dense, rounded clusters of 20-40 flowers on short auxiliary shoots each with a single pair of leaves. ^{2, 7, 8, 9, 10, 11, 13}</p> <p>Fruit: When ripe, red or orange drupes 1 to 1.5 cm long, egg shaped, in clusters of 2-5. Each drupe can</p>

	<p>remain on the bush over winter and possesses one large flattened stone.^{2, 7, 8, 9, 10, 11, 13}</p> <p>Drupe productions begins when the plant is 5 years old^{8, 11}</p> <p>Note: Fruit is edible. Makes a good cranberry sauce^{2, 7, 8, 9, 10, 11, 13}</p>
PROPAGATION DETAILS	
SEED	
Ecotype:	N/A
Propagation Goal	Plants ¹²
Propagation Method	Seeds ¹²
Product Type	Container (plug) ¹²
Stock Type:	No information available
Time to Grow:	No information available
Target Specifications:	Multiple leaves; firm root plug ¹²
Propagule Collection:	Collect ripe drupes by hand in late fall, early winter. ^{1, 3, 12}
Propagule Processing/Propagule Characteristics:	<p>Separate seed from pulp by either hand or a macerator.¹⁶</p> <p>Do not allow the seed to dry out .¹²</p> <p>Seeds per pound: 9,398-17,799¹¹</p> <p>Seed longevity: 10 years¹¹</p> <p>Seed dormancy: Morpho-physiological^{3, 5}</p>
Pre-Planting Propagule Treatments:	<p>Dormancy Treatment</p> <p>If sown soon after maturity then no dormancy treatment is needed, because dormancy has not set in¹</p> <p>If seeds are dormant: 3-9 months warm stratification (at 68°-70°F) followed by 3 months of cold stratification (refrigerate at 40°F) .^{1, 3, 5, 8, 11}</p> <p>Stratification can be done in soil media and flats you plan to germinate the seeds in¹²</p>
Growing Area Preparation / Annual Practices for Perennial Crops:	<p>Growing media: 3 ProMix HP: 1 perlite: 1 sand¹²</p> <p>Container: unknown sized flat¹²</p>
Establishment Phase:	Germination success will be higher in seeds that have been planted immediately after collection and have not entered dormancy then seeds that were stored from earlier in the season or previous years ¹²
Length of Establishment Phase:	No information available
Active Growth Phase:	After true leaves appear, transplant plants to small

Active Growth Phase:	After true leaves appear, transplant plants to small individual pots or 10-in ³ Spencer-Lemaire cells ¹²
Length of Active Growth Phase:	No information available
Hardening Phase	Move pots to a shady area outside for hardening ¹²
Length of Hardening Phase:	No information available
Harvesting, Storage and Shipping:	No information available
Length of Storage	No information available
Guidelines for Outplanting / Performance on Typical Sites:	No information available
PROPAGATION DETAILS VEGETATIVE	
Ecotype:	N/A
Propagation Goal:	Plants ⁵
Propagation Method:	Vegetative ⁵
Product Type:	Container (plug) ⁵
Stock Type:	800 ml containers ⁵
Time to Grow:	10 Months ⁵
Target Specifications:	Stock Type: Container cutting ⁵ Height: 20 cm ⁵ Caliper: 5 mm ⁵ Root System: Firm plug ⁵
Propagule Collection:	Propagation Method: Pre-Rooting Type of Cutting: Summer softwood stem cutting. Collect cutting in mid June from healthy donor plants after flowering. ⁵
Propagule Processing/Propagule Characteristics:	Cuttings should be 20 cm long and 0.5 cm in diameter ⁵
Pre-Planting Propagule Treatments:	Cutting Treatments: Recut cutting at the base and remove 1/3 of the basal leaves. Bathe each cutting for 2 minutes in a Domain fungicide bath. ⁵ Treat the cuttings with 3000 ppm Hormex rooting powder and strike them in rooting medium under a mist bench with bottom heat for 7 weeks. ⁵
Growing Area Preparation / Annual Practices for Perennial Crops:	Rooting media: 50% perlite and 50% sand ⁵ Mist bench: Set for automatic intermittent misting at 6-second intervals every 6 minutes. ⁵ Bottom heat: Maintain temperature at 21C with heating cables buried 12 cm beneath rooting media. ⁵ Growing media: 6:1:1 milled sphagnum peat, perlite, and vermiculite with Osmocote controlled release fertilizer (13N:13P ₂ O ₅ :13K ₂ O; 8 to 9 month release

	rate at 21C) and Micromax fertilizer (12%S, 0.1%B, 0.5% Cu, 12% Fe, 2.5% Mn, 0.05% Mo, 1% Zn) at the rate of 2 grams of Osmocote and 0.5 grams of Micromax. ⁵
Establishment Phase:	Time to Transplant: 7 weeks ⁵
Length of Establishment Phase:	7 weeks ⁵
Active Growth Phase:	After cuttings are well rooted, remove them from the mist bench and pot them in 800 ml pot filled with the growing media. ⁵ Place cuttings in a shade house for 4 weeks and then move to full sun exposure for remainder of the growing season. ⁵
Length of Active Growth Phase:	5 weeks ⁵
Hardening Phase:	Gradually reduce irrigation in September and October. Give plants one final irrigation prior to winterization. ⁵
Length of Hardening Phase:	4 weeks ⁵
Harvesting, Storage and Shipping:	Total Time To Harvest: 10 months ⁵ Harvest Date: May or June ⁵ Storage conditions: Overwinter in outdoor nursery under insulating foam cover and snow. ⁵
Length of Storage:	5 months ⁵
Guidelines for Outplanting / Performance on Typical Sites:	No information available
Other Comments:	As the plant is rhizomatous and is known to spread by layering in nature, it might be possible to propagate the species by divisions or purposeful layering. However no literature was found reviewing or discussing the effectiveness of either method for the propagation <i>Viburnum edule</i> .
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Note: This template was modified by J.D. Bakker from that available at: <http://www.nativeplantnetwork.org/network/SampleBlankForm.asp>

Appendix: Previous Plant Protocol (2003)
Plant Data Sheet



* Marble Canyon, Kootenay National Park, B.C., Canada – 9/13/02 – Marlo Mytty

Species

Squashberry/Highbush cranberry, *Viburnum edule* (Michx.) Raf.

Range

Common throughout northern North America. Throughout Alaska and across Canada to Newfoundland. Occurs south through New England, Great Lake states, and the Pacific Northwest. Populations also found in Idaho, Montana, North and South Dakota, Wyoming, and Colorado.

Climate, elevation

Mostly low to middle elevations. In B.C. from sea-level to 4900 ft.; but in Colorado 7000-9000 ft. Southern extent limited by high temperatures and low humidity. Restricted to wetter moisture regimes in dry climates.

Local occurrence (where, how common)

Moist woods or forests, forest edges, thickets, gravel or rocky banks and slopes, river bottomlands and terraces, lakes, streambanks, shorelines, and margins of wetlands, swamps, or bogs.

Habitat preferences

Moist, well-drained alluvial soils, sun (but mostly shade tolerant).

Plant strategy type/successional stage (stress-tolerator, competitor, weedy/colonizer, seral, late successional)

Important through all stages of succession. Important component of early, mid-seral, and climax postfire communities. Seed-banking species. Soil disturbance generally favors germination of stored seed. Root and stem sprouts after damage.

Associated species

White spruce, black spruce, paper birch, balsam poplar, quaking aspen, willows, alders, raspberries, currants, prickly rose (*Rosa acicularis*), huckleberry (*Vaccinium vitis-idaea*)

May be collected as: (seed, layered, divisions, etc.)

Cuttings or seeds. Can reproduce by natural layering.

Collection restrictions or guidelines

Restrictions: Rare in South Dakota and on official watch list in Maine. Threatened in Michigan, New York, and Vermont. Endangered in Wisconsin.

Guidelines: Cuttings: collect mid-June or later after flowering. Seeds: collect mature fruits when they turn red. Fruits ripen August-October. Seeds are brown at maturity.

Seed germination (needs dormancy breaking?)

Most have embryo dormancy and some impermeable seedcoats. Requires 2-stage stratification to be broken. 3-5 months of warm moist stratification at 22 C followed by 3 months of cold moist stratification at 5 C.

Seed life (can be stored, short shelf-life, long shelf-life)

Last up to 10 years.

Recommended seed storage conditions

Clean, air-dried seeds in sealed containers at 1-3 C for long-term storage.

Propagation recommendations (plant seeds, vegetative parts, cuttings, etc.)

Vegetatively by cuttings – softwood best. Rhizome or hardwood cuttings also work. Cuttings 20 cm long and .5 cm in caliper. Rooting greatly increased by treating cuttings with IBA (Indole-3-butyric acid). Harden outside over winter, under insulating foam cover and snow. Seeding may be used. Either broadcast on prepared seedbeds and mulch with sawdust or sow with drills and mulch with straw. Fertile, moist neutral-slightly acidic soils for germination. Seedlings and cuttings may require shading depending on location

Soil or medium requirements (inoculum necessary?)

Moist soils preferred. For cuttings, sand is good rooting medium.

Installation form (form, potential for successful outcomes, cost)

Seeds or seedlings from seeds or rooted cuttings.

Recommended planting density

No information

Care requirements after installed (water weekly, water once etc.)

Moist soils.

Normal rate of growth or spread; lifespan

Plant first produces fruits at 5 years of age, then in large quantities. Germination is normally delayed until 2nd growing season after ripening. No information about lifespan except perennial plant.

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Luna, Tara. 2001. Propagation protocol for vegetative production of container *Viburnum edule* (Michx.) Raf. plants (800 ml containers); Glacier National Park, West Glacier, Montana. In: Native Plant Network. URL: <http://www.nativeplantnetwork.org> (accessed 16 April 2003). Moscow (ID):University of Idaho, College of Natural Resources, Forest Research Nursery.

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Data compiled by: Marlo Mytty, April 16, 2003