Plant Propagation Protocol for *Vitis Riparia*

ESRM 412 – Native Plant Production

Spring 2009

Figure 1: Wild Vitis Riparia with ripening fruit on sandy soil. Sandbanks Provincial Park in Prince Edward County, Ontario, Canada. (Photo credit: United States Department of Agriculture, 2009)

TAXONOMY	
Family Names	
Family Scientific Name:	Vitaceae
Family Common Name:	Grape family
Scientific Names	
Genus:	*Vitis*
Species:	*Riparia*
Species Authority:	Michx.
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)	*Vitis cordifolia* var. *riparia* (A. Gray) *Vitis riparia* Michx. var. *syrticola* (Fernald & Wiegand) Fernald *Vitis vulpina* L. ssp. *riparia* (Michx.) R.T. Clausen *Vitis vulpina* L. var. *praecox* (Engelm. ex L.H. Bailey) L.H. Bailey *Vitis vulpina* L. var. *syrticola* Fernald & Wiegand (United States Department of Agriculture, 2009)
Common Name(s):	Riverbank grape, Frost Grape, Riverside grape, Sweet-scented grape, Bull grape, Winter Grape, River grape, Arroyo Grape (MacKenzie, 2002)
Species Code (as per USDA Plants database):	VIRI
GENERAL INFORMATION	
Geographical range (distribution maps for North America and Washington state)	Northeastern U.S.A.: United States - Connecticut, Indiana, Maine, Massachusetts, Michigan, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, West Virginia North-Central U.S.A.: United States - Illinois, Iowa, Kansas [e.], Minnesota, Missouri, Nebraska, North Dakota, Oklahoma, South Dakota, Wisconsin Southeastern U.S.A.: United States - Alabama, Arkansas, Delaware, Kentucky, Louisiana, Maryland, Mississippi [n.], Tennessee, Virginia [n.] South-Central U.S.A.: United States - Texas (See map of distribution) Also: Eastern Canada: Canada - New Brunswick, Nova Scotia, Ontario, Quebec [s.] Western Canada: Canada - Manitoba [s.], Saskatchewan [s.e.] (United States Department of Agriculture, Agricultural Research Service, Beltsville Area, 29) Europe.

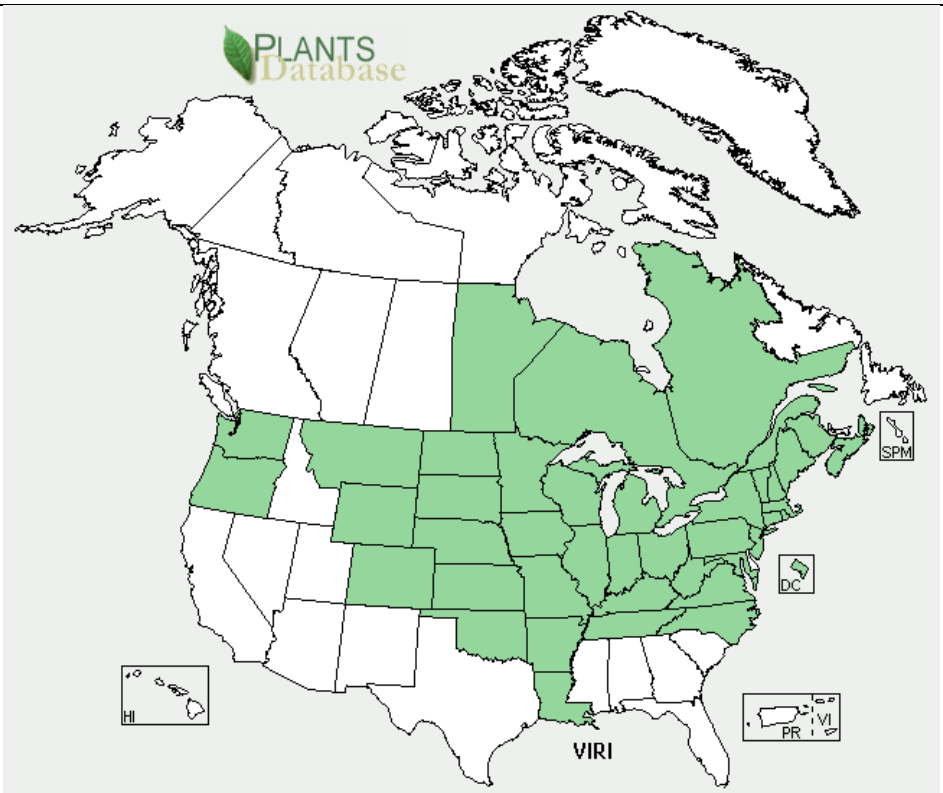

Figure 2: Vitis Riparia Michx. Distribution in North America. Shaded – present, white – absent. (Credit: United States Department of Agriculture, 2009)

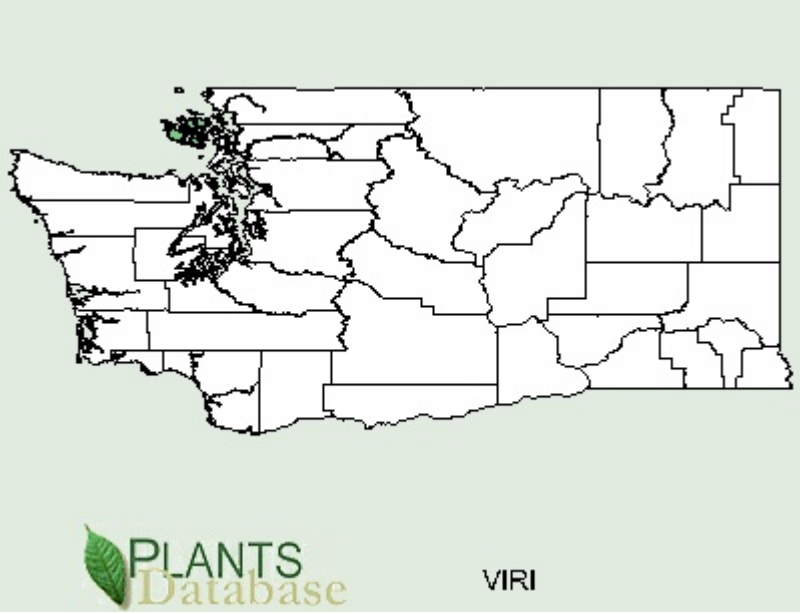

Figure 3: Vitis Riparia Michx. Distribution in Washington State. Shaded - present, white- absent. (United States Department of Agriculture, 2009)

Ecological distribution (ecosystems it occurs in, etc):	***Vitis Riparia*** or Riverbank grape likes moist soils, riverbanks, bottomlands, rich thickets and woodland margins. In the wild, the vine thrives along exposed areas with good sun exposure and adequate soil moisture, such as riverbanks, forest clearings, fence lines and along road sides. (Forest Service, 1948)
Climate and elevation range	Variants of the species have been observed as far north as Riding Mountain National Park in Manitoba, Canada and as far west as Montana, Nebraska, and North Dakota. In Washington found on the North – East Sound Islands: San Juan Island, Orcas Island, Lopez Island. The species has adapted to a variety of soil chemistries.
Local habitat and abundance; may include commonly associated species	Usually occurs in wetlands (estimated probability 67%-99%), but occasionally found in non-wetlands. (United States Department of Agriculture, 2009)
Plant strategy type / successional stage (stress-tolerator, competitor, weedy/colonizer, seral, late successional)	Some *V. riparia* vines have been known to withstand temperatures of up to -57 °C (−70 °F). The foliage is typically resistant to mildew and black rot, and the roots resistant to phylloxera. The berries however, are often sensitive to mildew and black rot if the vine is exposed to prolonged wet and humid conditions. (Forest Service, 1948) This species roots and grafts with ease and has strong resistance to phylloxera, and moderate to weak resistance to nematodes. It was directly used as a rootstock in Europe, but scions grafted to it had poor tolerance to lime-based soils. Crosses of *riparia* with *berlandieri* are among the most popular rootstocks in the world, and are widely adapted. (University of California, Division of Agricultural and Natural Resources Integrated Grape Production Workgroup, 2009)
Plant characteristics (life form (shrub, grass, forb), longevity, key characteristics, etc)	*Vitis Riparia* is a deciduous, climbing or trailing vine, often ascending high into tall trees. It is long-lived and capable of reaching into the upper canopy of the tallest trees. Riverbank grape is cultivated for more than four hundred years and is valuable in making vine and preserves, and as a honey plant. The flowers have very pleasant fragrance (Forest Service, 1948).
PROPAGATION DETAILS (Forest Service, 1948) (if not marked otherwise)	
Propagation Goal (Options: Plants, Cuttings, Seeds, Bulbs, Somatic Embryos, and/or Other Propagules):	Plants
Propagation Method	Seed.

(Options: Seed or Vegetative):	 **Figure 4: Vitis riparia seeds (Picture credit (Hurst, 2009)** Seeds usually 2-4, small, slightly notched, short, plump, and with short beak (The Winemaking Home Page, 2000) Note: Plant could be propagated by Bare Root, Container, Cuttings and Seed.
Product Type (options: Container (plug), Bareroot (field grown), Plug + (container-field grown hybrids, and/or Propagules (seeds, cuttings, poles, etc.))	Container.
Stock Type:	
Time to Grow (from seeding until plants are ready to be outplanted):	If sown outside, seed may take another 12 months to germinate. (Twining Vine Garden Seed Store, 2007)
Target Specifications (size or characteristics of target plants to be produced):	The vines are ready to leave the nursery when they have at least two fully formed leaves in addition to the as soon as the weather permits condition. Mature vines have loose, fissured bark, and may attain several inches in diameter. Leaves are alternate, often with opposite tendrils or inflorescences, coarsely toothed, 5–25 cm (2–10in) long and 5–20 cm (2–8in) broad, sometimes with sparse hairs on the underside of veins.
Propagule Collection (how, when, etc):	The fruit ripens from September to November and may persist into winter. The fruit may be collected as soon as it ripe. Berries usually contain one to four seeds. In wild seeds are often dispersed by birds or mammals. Unless the seed is to be extracted soon, the fruit should be piled in rather shallow layers to prevent heating. Seed stored in a sealed container for about seven month in the form of dried berries, showed no loss in viability after 26 month at 41°F.

Propagule Processing/Propagule Characteristics (including seed density (# per pound), seed longevity, etc):	Clean seeds per pound (6 samples): low, 11,300; average, 15,200; high, 17,200. Purity, 99 percent; soundness, 91 percent (6 samples).
Pre-Planting Propagule Treatments (cleaning, dormancy treatments, etc):	The seed is extracted by running the fruit with water through macerator or mill and allowing the pulp and empty and wormy seeds to float away. Seed could also be stored in the form of dried berries.
Growing Area Preparation / Annual Practices for Perennial Crops (growing media, type and size of containers, etc):	
Establishment Phase (from seeding to germination):	Seed of this species should be fall sown or stratified for about 60 days prior to spring sowing. Six weeks cold stratification improves the germination rate, and so stored seed is best sown in a cold frame as soon as it is obtained. Suggested stratification – for 60 to 120 days at 41°F. Germinative energy: 41 to 96 percent in 13 to 16 days.
Length of Establishment Phase:	
Active Growth Phase (from germination until plants are no longer actively growing):	
Length of Active Growth Phase:	
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):	
Length of Hardening	

Phase:	
Harvesting, Storage and Shipping (of seedlings):	The fruit may be collected as soon as it is ripe by stripping the clusters from the vines or, later in the season, by shaking the vines and collecting the fruit on canvas.
Length of Storage (of seedlings, between nursery and outplanting):	
Guidelines for Outplanting / Performance on Typical Sites (eg, percent survival, height or diameter growth, elapsed time before flowering):	
Other Comments (including collection restrictions or guidelines, if available):	
PROPAGATION DETAILS **Other methods - Grafting** (Hartmann, Kester, & Davies, Plant Propagation: Principles and Practices, 1990) (Hartmann, Kestler, Davies, & Geneve, 2002)	
Greenwood Grafting	For propagating grapes on resistant rootstocks a simple and rapid procedure called greenwood grafting is used. A one-budded greenwood scion is splice-grafted during the active growing season on new growth arising rooted cutting.
Propagation Goal (Options: Plants, Cuttings, Seeds, Bulbs, Somatic Embryos, and/or Other Propagules):	Rootstock
Propagation Method (Options: Seed or Vegetative):	Vegetative
Product Type (options: Container (plug), Bareroot (field grown), Plug + (container-field grown hybrids,	Boxes or plastic bags with well aerated and moist wood shavings or peat moss. Or containers later on.

and/or Propagules (seeds, cuttings, poles, etc.))	
Stock Type:	
Time to Grow (from seeding until plants are ready to be outplanted):	9 to 12 weeks.
Target Specifications (size or characteristics of target plants to be produced):	Grafting is done from completely dormant scion and rootstock material. The stocks are cut from 31 to 36 cm.
Propagule Collection (how, when, etc):	Grafting is done in late winter or early spring. The stocks are cut from 31 to 36 cm with lower cut just below the node and the top cut 2.5 cm or above a node. The stock and scionwood should have the same diameter.
Propagule Processing/Propagule Characteristics (including seed density (# per pound), seed longevity, etc):	For callusing the grafts should be placed in boxes or plastic bags with well aerated and moist wood shavings or peat moss for 3-4 weeks at temperature about 26.5 C. Prior to planting to the nursery or vineyard the growing bench grafts are transferred to a 50% shade screen house for about two weeks for hardening-off.
Pre-Planting Propagule Treatments (cleaning, dormancy treatments, etc):	To prevent subsequent suckering all buds are removed from the rootstock. After 3-4 weeks, when the callusing is complete roots are trimmed to an 18 mm stub and the bench grafts should be paraffinned.
Growing Area Preparation / Annual Practices for Perennial Crops (growing media, type and size of containers, etc):	First moist wood shavings or peat moss are used to make good grafts. Then the growing bench grafts are planted in the soil.
Establishment Phase (from seeding to germination):	
Length of Establishment Phase:	
Active Growth Phase (from germination until plants are no	

longer actively growing):	
Length of Active Growth Phase:	
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):	
Length of Hardening Phase:	
Harvesting, Storage and Shipping (of seedlings):	The fruit are ripening in September, and could be harvested up until the first frosts.
Length of Storage (of seedlings, between nursery and outplanting):	
Guidelines for Outplanting / Performance on Typical Sites (eg, percent survival, height or diameter growth, elapsed time before flowering):	
Other Comments (including collection restrictions or guidelines, if available):	The plant needs special supporting system, for example poles or wires. Even if the Vitis is grown next to the wall is it suggested to put a net made of wires to support the plant's growth, access to the sun and fruit ripening. (Природное органическое удобрение ArganiQ , 2008)
PROPAGATION DETAILS **Other methods - Field Budding** (Hartmann, Kester, & Davies, Plant Propagation: Principles and Practices, 1990) (Hartmann, Kestler, Davies, & Geneve, 2002)	
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.))	Well rooted cuttings
Stock Type:	
Time to Grow (from seeding until plants are ready to be outplanted):	Grape cultivars are established by inserting field bud onto rapidly growing, well rooted cuttings that had been planted in their permanent vineyard location the previous winter or spring.
Target Specifications (size or characteristics of target plants to be produced):	
Propagule Collection (how, when, etc):	T-budding can then be done in late spring using dormant budwood held under refrigeration.
Propagule Processing/Propagule Characteristics (including seed density (# per pound), seed longevity, etc):	
Pre-Planting Propagule Treatments (cleaning, dormancy treatments, etc):	
Growing Area Preparation / Annual Practices for Perennial Crops (growing media, type and size of containers, etc):	
Establishment Phase (from seeding to	

germination):	
Length of Establishment Phase:	
Active Growth Phase (from germination until plants are no longer actively growing):	
Length of Active Growth Phase:	
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):	
Length of Hardening Phase:	
Harvesting, Storage and Shipping (of seedlings):	
Length of Storage (of seedlings, between nursery and outplanting):	
Guidelines for Outplanting / Performance on Typical Sites (eg, percent survival, height or diameter growth, elapsed time before flowering):	
Other Comments (including collection restrictions or guidelines, if available):	Later in summer or early fall the bud should be chipped as soon as fresh mature buds from wood with light brown bark can be obtained and before the stock goes dormant. The bud is inserted in the stock 5 to 10 cm above the soil level, tied in place with poly budding tape, or budding rubber, but not waxed. Then the bud is covered with moist soil to prevent drying (from 13 to 25 cm).
PROPAGATION DETAILS **Other methods - Hardwood Cuttings**	

(Hartmann, Kester, & Davies, Plant Propagation: Principles and Practices, 1990) (Hartmann, Kestler, Davies, & Geneve, 2002)	
Propagation Goal (Options: Plants, Cuttings, Seeds, Bulbs, Somatic Embryos, and/or Other Propagules):	Cuttings
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.))	Grapes often propagated by dormant hardwood cutting, which root readily.
Stock Type:	
Time to Grow (from seeding until plants are ready to be outplanted):	
Target Specifications (size or characteristics of target plants to be produced):	
Propagule Collection (how, when, etc):	Cutting material should be collected during the winter from healthy, vigorous, mature vines.
Propagule Processing/Propagule Characteristics (including seed density (# per pound), seed longevity, etc):	
Pre-Planting Propagule Treatments (cleaning, dormancy treatments, etc):	Current season, well developed with short internodes medium size canes should be used.
Growing Area	

Preparation / Annual Practices for Perennial Crops (growing media, type and size of containers, etc):	
Establishment Phase (from seeding to germination):	
Length of Establishment Phase:	
Active Growth Phase (from germination until plants are no longer actively growing):	
Length of Active Growth Phase:	
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):	
Length of Hardening Phase:	
Harvesting, Storage and Shipping (of seedlings):	
Length of Storage (of seedlings, between nursery and outplanting):	In spring cuttings (Diameter 8 to 13 mm; length 36 to 46 cm) planted that soil covers all but one bud. The large enough plants for transplantation to the vineyard grow in one season.
Guidelines for Outplanting / Performance on Typical Sites (eg, percent survival, height or diameter growth, elapsed time before flowering):	

Other Comments (including collection restrictions or guidelines, if available):	

PROPAGATION DETAILS **Other methods - Greenwood Grafting** (Hartmann, Kester, & Davies, Plant Propagation: Principles and Practices, 1990) (Hartmann, Kestler, Davies, & Geneve, 2002)	
Greenwood Grafting	For propagating grapes on resistant rootstocks a simple and rapid procedure called greenwood grafting is used. A one-budded greenwood scion is splice-grafted during the active growing season on new growth arising rooted cutting.

INFORMATION SOURCES

References (full citations):	See Below
Other Sources Consulted (but that contained no pertinent information) (full citations):	See Below
Protocol Author (First and last name):	Yana Kazak
Date Protocol Created or Updated (MM/DD/YY):	4/28/2009

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