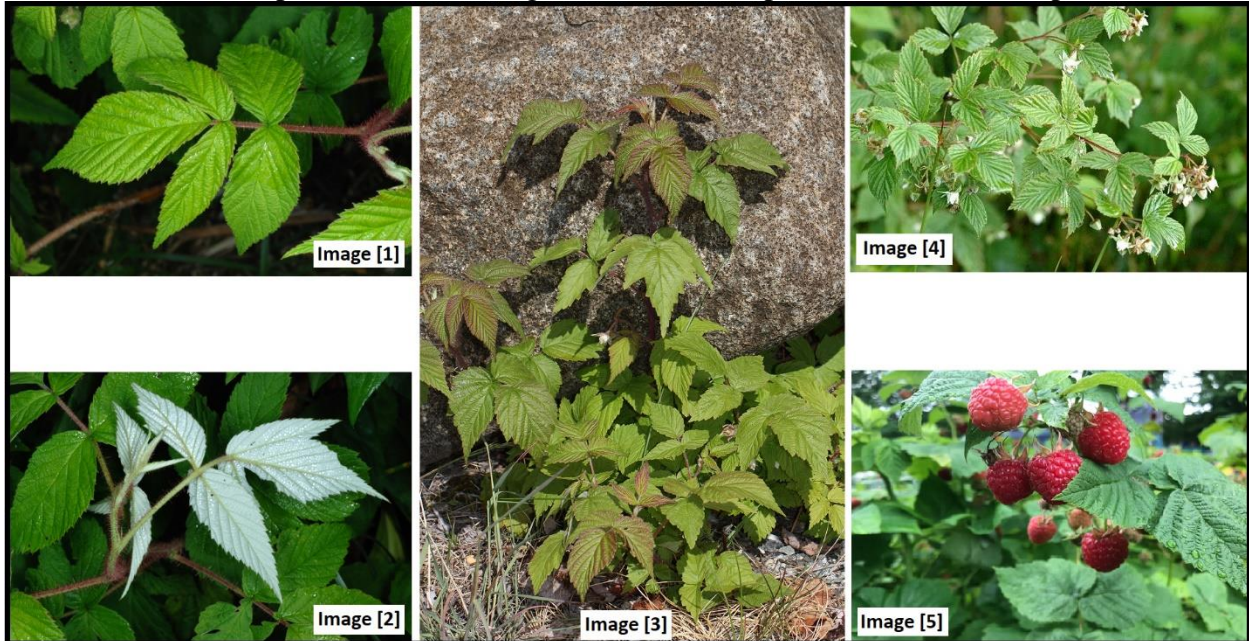


Plant Propagation Protocol for *Rubus idaeus* L.

ESRM 412 – Native Plant Production

URL: <https://courses.washington.edu/esrm412/protocols/2021/RUID.pdf>



TAXONOMY

Plant Family

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| Scientific Name | Rosaceae |
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| Common Name | Rose |
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Species Scientific Name

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| Scientific Name | <i>Rubus idaeus</i> Linnaeus, Carol |
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| Varieties | -- |
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| Sub-species | ssp. <i>idaeus</i> – American red raspberry ssp. <i>strigosus</i> (Michx.) Focke – Grayleaf red raspberry |
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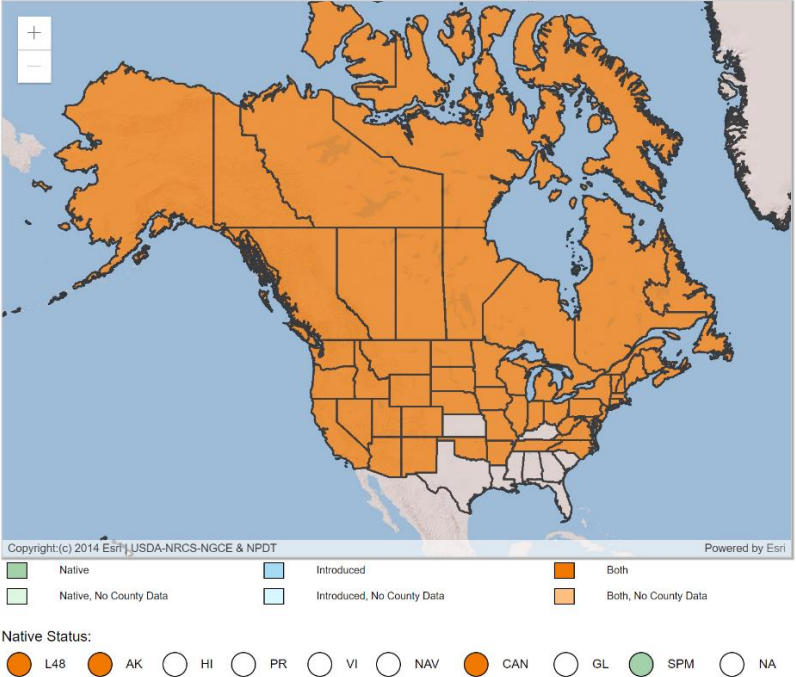
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| Cultivar | -- |
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| Common Synonym(s) | <i>R. idaeus</i> ssp. <i>sachalinensis</i> Focke |
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| Common Name(s) | American red raspberry Black-haired red raspberry Brilliant red raspberry Raspberry Red raspberry Smoothleaf red raspberry Wild raspberry Wild red raspberry Greyleaf raspberry [2] |
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| Species Code | RUID |
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GENERAL INFORMATION

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| <p>Geographical range</p> |  <p>Copyright:(c) 2014 Esri USDA-NRCS-NGCE & NPOT Powered by Esri</p> <p>Native Status: <input checked="" type="radio"/> L48 <input checked="" type="radio"/> AK <input type="radio"/> HI <input type="radio"/> PR <input type="radio"/> VI <input type="radio"/> NAV <input checked="" type="radio"/> CAN <input type="radio"/> GL <input type="radio"/> SPM <input type="radio"/> NA</p> |
| <p>Ecological distribution</p> | <p>The American red raspberry can be found throughout North America from Alaska, through Canada to Newfoundland, South to North Carolina, and west to California. [2, 3]</p> |
| <p>Climate and elevation range</p> | <p>Widespread throughout boreal forests American red raspberry may be present in elevations ranging from 2,400 to 11,000 feet in clearings, edges of woods, burnt areas, bluffs, riverbanks, parries, and as a roadside weed. It may be present on rocky screes, talus slopes above timberlines. [1, 2, 3]</p> |
| <p>Local habitat and abundance</p> | <p>American red raspberry grows with a wide variety of plants across its wide geographic range. Particular common associations: Canada beadruby, thimbleberry, bunchberry huckleberry, fireweed, bluejoint reedgrass, kinnikinnick, Virginia strawberry, green alder, twinflower, sedges, prickly rose, twinberry, lowbush, bog Labrador tea, red currant, highbush cranberry, and red-osier dogwood. [2, 3]</p> |
| <p>Plant strategy type / successional stage</p> | <p>American red raspberry can reproduce sexually through seed production or vegetatively through root sprouts and basal stem buds, or root crowns. It is mostly made up of biennial canes (stems) on a long-lived perennial rootstock. The rootstock grows into a sterile first year primocane that generally bears only leaves. Second year lateral floricanes will develop both leaves and fruit. [1, 2, 3, 4, 5]</p> |

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| Plant characteristics | The American red raspberry is deciduous thicket-forming shrub standing 1.6 to 9.8 feet. The woody stems are covered in prickly bark that sheds exposing a yellow-brown bark. The leaves are green and glabrous on the top surface and white or grey on the bottom. Small showy white flowers develop into red berries. [1, 2, 4] |
| PROPAGATION DETAILS | |
| Ecotype | The genetics of <i>Rubus</i> is complex because of the presence of sexual and asexual reproduction. Cuttings should be harvested from a similar location and close to the target planting location due to its high variability and ability to hybridize with other species. The subgenus <i>Idaeobatus</i> is predominantly diploid and sexual reproduction is most common. Crossability among species within both subgenera has been studied [1, 2] |
| Propagation Goal | Plants |
| Propagation Method | In vitro propagation using meristem-tips [7] |
| Product Type | Container |
| Stock Type | 1 gallon |
| Time to Grow | 1 years [7] |
| Target Specifications | At least one floricanes and several primocanes [5] |
| Propagule Collection Instructions | Field-grown shoots should be cut into short segments during the spring [7] |
| Propagule Processing/Propagule Characteristics | 50,000 plantlets per year from one cutting is possible [7] |
| Pre-Planting Propagule Treatments | Surface-disinfecting can reduce the problem of virus contamination by washing cuttings for 30min in 80% isopropanol, followed by rinsing in sterile distilled water. Buds are then dissected using a scalpel, low-power stereomicroscope, and a laminar-flow bench. The tips of the dissected buds (about 1 mm), including the meristem-tip and several leaves, are placed in 2.5 × 10 cm test-tubes. [7] |
| Growing Area Preparation / Annual Practices for Perennial Crops | The test tubes contain soil medium (unknown mix) and microelements (unknown) which are then closed with plastic caps. They are then incubated for several weeks in a growth-chamber illuminated with lamps and adjusted for a 16-h photoperiod, at 26°C with air humidity of 70%. [7] |

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| Establishment Phase Details | The developing shoots are then transferred to a second medium, that contain a double dose of FeEDTA (40 mg/l), 5g activated charcoal, and no growth hormones, under the same growth-chamber conditions. When the rosette elongates and produces a long shoot with several leaves and buds, cut it into several micro-cuttings of 2 nodes each and plant them in the same medium. This can be repeated every 4 weeks and has a multiplication rate of 2-3 per month. [7] |
| Length of Establishment Phase | Cuttings planned for establishing plants should be placed in pellets with good aeration to enhance root development. In about 2 weeks roots should establish in the new cuttings and they can be transplanted into containers with soil:sand:peat moss (1:1:1). Continue to grow them under the same growth-chamber conditions for another 2 weeks. [7] |
| Active Growth Phase | One month after shoots are removed rom test tubes, they should be transferred into a shaded screen house. [7] |
| Length of Active Growth Phase | Unknown |
| Hardening Phase | Unknown |
| Length of Hardening Phase | Unknown |
| Harvesting, Storage and Shipping | Unknown |
| Length of Storage | Unknown |
| Guidelines for Outplanting / Performance on Typical Sites | Plants removed from test tubes in September, can be planted in the field in March, and can even bare fruits in the coming September. [7] |
| Other Comments | |
| INFORMATION SOURCES | |
| References | <p>[1] Brand, G. J., Karrfalt, R. P., Landis, T. D., Lantz, C. W., Mangold, R. D., Nisley, R. G , Schopmeyer, C. S., Tappeiner III, J C., & Zasada J. C., 2008. <i>The woody plant seed manual</i>. U.S. Dept. of Agriculture, Forest Service. from https://www.fs.fed.us/rm/pubs_series/wo/wo_ah727.pdf</p> <p>[2] Tirmenstein, D., 1990. <i>Rubus idaeus</i>. Fire Effects Information System, U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory, from: https://www.fs.fed.us/database/feis/plants/shrub/rubida/all.html</p> <p>[3] Hardy BBT Limited., 1989. <i>Manual of Plant Species Suitability for Reclamation in Alberta, ed. 2</i>, doi: https://doi.org/10.7939/R3FW17</p> |

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|-------------------------|---|
| | <p>[4] Crane, M. B., 1940. <i>Reproductive versatility in Rubus</i>. I. Morphology and inheritance. <i>Journal of Genetics</i>., from: https://www.nature.com/articles/hdy19495.pdf</p> <p>[5] Hudson ,J. P., 1959. <i>Effects of Environment on Rubus Idaeus L.: I. Morphology and Development of the Raspberry Plant</i>, <i>Journal of Horticultural Science</i>, 34:3, 163-169, DOI: https://doi.org/10.1080/00221589.1959.11513955</p> <p>[6] National Plant Data Team. <i>Rubus idaeus L.</i> United States Department of Agriculture Natural Resources Conservation Service, from: https://plants.sc.egov.usda.gov/home/plantProfile?symbol=RUID</p> <p>[7] Snir, Iona. 1981. <i>Micropropagation of Red Raspberry</i>, <i>Scientia Horticulturae</i>, vol. 14, no. 2, 1981, pp. 139–143., doi: https://doi.org/10.1016/0304-4238(81)90005-4</p> <p>Images:</p> <p>[1] https://s3.amazonaws.com/eit-planttoolbox-prod/media/images/Rubus_idaeus_ssp._st_AWTjTOKF31r5.jpg</p> <p>[2] https://s3.amazonaws.com/eit-planttoolbox-prod/media/images/Rubus_idaeus_ssp._st_NKKDbRXovpGd.jpg</p> <p>[3] https://upload.wikimedia.org/wikipedia/commons/5/5b/Rubus_strigosus_8782.JPG</p> <p>[4] https://www.commanster.eu/Commanster/Plants/Flowers/SpFlowers/Rubus.idaeus2.jpg</p> <p>[5] https://s3.amazonaws.com/eit-planttoolbox-prod/media/images/Rubus_idaeus-fruit-1_RfutSQak99OM.jpg</p> |
| Other Sources Consulted | <p>Alvarado-Raya, H. E., Darnell, R. L., & Williamson, J. G. 2007. <i>Root to Shoot Relations in an Annual Raspberry (Rubus idaeus L.) Production System</i>, <i>HortScience horts</i>, 42(7), 1559-1562., from: https://journals.ashs.org/hortsci/view/journals/hortsci/42/7/article-p1559.xml</p> <p><i>Rubus Idaeus Var. Strigosus</i>.2021 NC State University, North Carolina Extension Gardener Plant Toolbox, from: https://plants.ces.ncsu.edu/plants/rubus-idaeus-var-strigosus/</p> <p><i>Rubus Idaeus (Wild Red Raspberry)</i>. Minnesota Wildflowers, from: www.minnesotawildflowers.info/shrub/wild-red-raspberry</p> <p>Hodnefjell, R., et al. <i>Control of Growth Cessation and Floral Initiation in Red Raspberry (Rubus Idaeus L.) Cultivars of Diverse Origin in Controlled and Natural Environments</i>. <i>Scientia Horticulturae</i>, vol. 233, 2018, pp. 412–420., doi: https://doi.org/10.1016/j.scienta.2018.02.011</p> |
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| Date Protocol Created | 05/25/2021 |