

Plant Propagation Protocol for *Rhus trilobata*

ESRM 412 – Native Plant Production

URL: <https://courses.washington.edu/esrm412/protocols/2026/RHTR.pdf>



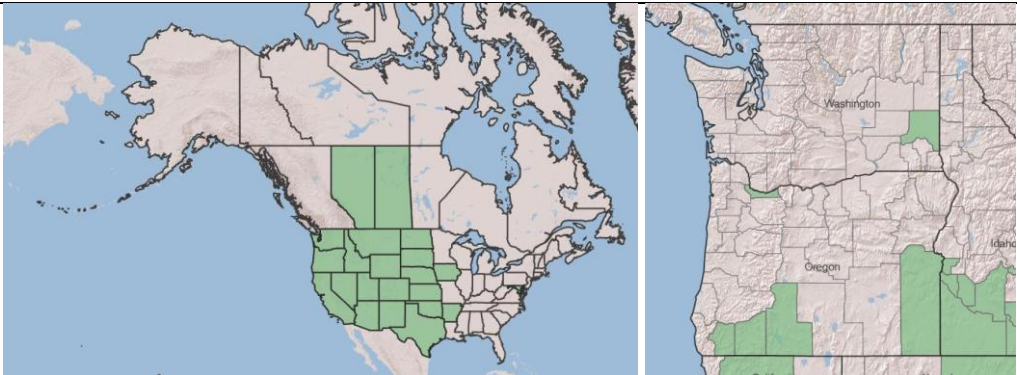
Leaves and fruit. Sourced from Landscape Plants - Oregon State University.¹¹

TAXONOMY

TAXONOMY	
Plant Family	
Scientific Name	Anacardiaceae
Common Name	Sumac family
Species Scientific Name	
Scientific Name	<i>Rhus trilobata</i> Nutt.
Varieties	<i>Rhus trilobata</i> var. <i>anisophylla</i> (Greene) Jepson <i>Rhus trilobata</i> var. <i>pilosissima</i> Engelm. <i>Rhus trilobata</i> var. <i>quinata</i> (Greene) Jepson <i>Rhus trilobata</i> var. <i>racemulosa</i> (Greene) Barkl. <i>Rhus trilobata</i> var. <i>simplicifolia</i> (Greene) Barkl. <i>Rhus trilobata</i> var. <i>trilobata</i>
Sub-species	No sub-species recognized by the USDA.

Cultivar	<i>Rhus trilobata</i> 'Bighorn'
Common Synonym(s)	<i>Rhus aromatica</i> Aiton var. <i>flabelliformis</i> Shinners <i>Rhus aromatica</i> Aiton ssp. <i>flabelliformis</i> (Shinners) R.E. Brooks <i>Rhus aromatica</i> Aiton ssp. <i>trilobata</i> (Nutt.) W.A. Weber <i>Rhus aromatica</i> Aiton var. <i>trilobata</i> (Nutt.) A. Gray ex S. Watson <i>Schmaltzia trilobata</i> (Nutt.) Small
Common Name(s)	Skunkbush, skunkbrush, polecat bush, stinking sumac, ill-scented sumac, quailbush, squawbush, squawberry, basketbush, lemonade sumac, three-lobed sumac, three-leaved sumac, lemita
Species Code (as per USDA Plants database)	RHTR

GENERAL INFORMATION

Geographical range	 <p><i>United States (left) and Pacific Northwest (right) distribution of R. trilobata. Sourced from USDA PLANTS Database.¹⁰</i></p> <p>Distributed across much of western North America. <i>R. trilobata</i>'s native range includes most states west of the Mississippi and extends North-South from Alberta and Saskatchewan down to Texas.^{5,12,14} Distribution within Washington and Oregon is more limited.¹⁰</p>
Ecological distribution	<p>Grows readily on rocky slopes, streamsides, sand dunes, and roadsides.^{5,9,13} Highest growth densities appear on uplands by major rivers and on southwestern exposures.⁹ <i>R. trilobata</i> can survive on soil types from sand, to heavy clay, to bare rock, but grows best on well-drained soil.^{5,13}</p> <p>Full-sun, but tolerates part-shade.^{5,13}</p>

Climate and elevation range	<p>Considered winter hardy within range, however this varies by variety.¹³ Requires a minimum frost-free growing season of 120-140 days.⁹⁻¹⁰ Exhibits medium drought tolerance, with growth being mildly stunted by water-stress.¹⁰⁻¹²</p> <p>Generally found on elevations between 1,000-3,000 meters.^{5,12}</p>
Local habitat and abundance (may include commonly associated species)	<p>Mainly occurs in stands lacking complete tree-cover and with poorly developed ground cover.^{8,13} The presence of seeded grasses and herbs may negatively impact survival.^{10,13} Commonly associated with mountain-mahoganies, serviceberries, big and sand sagebrushes, Gambel and turbinella oaks, rabbitbrushes, ponderosa pine, Rocky Mountain juniper, bluebunch wheatgrass, and fringed sagewort.^{8,13} Given its large range, there are many more grasses, shrubs, and herbs commonly associated with skunkbush.¹³</p>
Plant strategy type / successional stage	<p><i>R. trilobata</i> is prominent in early seral communities.¹⁰ After fire, woody rhizomes and adventitious buds sprout vigorously, crown width and coverage increase, sprouting may be delayed to increase survival.^{10,13}</p> <p>In some shrub and grassland communities, <i>R. trilobata</i> is a climax species.¹² Tolerant of heavy grazing and is considered to have low palatability for many herbivores.^{10,13}</p> <p>These resilient characteristics have allowed for its usage in reclamation of disturbed lands (notably mine lands), roadside plantings, and for erosion control.^{10,13-14}</p>
Plant characteristics	<p>Thicket-forming shrub between 2-8 m. Often low-growing and spreading with crown diameter greater than height, but also may have upright form.^{10-11,13} Extensively branched and deep root system, shallow rhizomes and root crown send out sprouts and connect separate shrubs.^{10,13}</p> <p>Branches and stems pubescent.</p> <p>Leaves: alternate and pinnately compound with 3 leaflets; leaflets: variably-sized, stalkless, base wedge-shaped, coarsely toothed, terminal generally trilobed.^{10-11,13} Strong (unpleasant) odor when crushed.^{11,13}</p> <p>Flowers: small, five-petaled, yellowish to greenish-white, polygamodioecious; male in catkins, female in terminal clusters.^{11,10,13}</p> <p>Fruit: small, fleshy, orangish-red, glandular; drupe with one stony nutlet.^{7,10,13} Seed production nearly every year.¹⁰</p>
PROPAGATION DETAILS: FROM SEED – Bareroot	
Ecotype	N/A

Propagation Goal	Plants ⁴
Propagation Method	Seed ⁴
Product Type	Bareroot (field grown) ⁴
Stock Type	2+0 ⁴
Time to Grow	2 Years ⁴
Target Specifications	12" height, 3/16" caliper. Aim for a balance between root system size and top growth. ⁴
Propagule Collection Instructions	Wild collection of seeds done in fall months when berry color is a deep red to brown. ^{1,4} Hand-pick fruits/clusters and collect in an open paper bag to avoid excess moisture. ^{1-2,13}
Propagule Processing/Propagule Characteristics	Seeds are approximately 5 mm by 4 mm and 14-23 mg. ⁷ Seed density is around 19,430 ² - 25,790 ¹² seeds/pound. <i>R. trilobata</i> seeds may be long-lived in the humus layer. ¹⁰
Pre-Planting Propagule Treatments	<p>Cleaning Methods:</p> <ol style="list-style-type: none"> 1. Beat fruit in a canvas sack, fan; then clean in a fanning mill.¹³ 2. Or soak fruits for a few days to encourage mesocarp detachment from endocarp.⁸ Rub between two mesh screens, wash in tap water, the endocarp/seed unit should sink to the bottom.^{2,8} Dry then air-screen lot.² 3. Or rack dry until skin can be easily removed. Roll using a mano across a metate until flesh/skin removed from seed.¹ <p>Storage: Store dry seeds in air tight containers at temperatures below freezing.⁴</p> <p>Dormancy: <i>R. trilobata</i> exhibits physical dormancy due to its water impermeable seed coat.^{3,6-7} It is inconclusive whether seeds may also experience physiological dormancy, and this may vary between seedlots.^{3,6-7,14}</p> <p>Breaking Dormancy: two-step treatment.</p> <ol style="list-style-type: none"> 1) Scarify via soaking in a sulfuric acid bath (10% H₂SO₄) for 0.5-1.5 hours.^{3-7,14} Immediately after acid bath, imbibe in water for 1 to 2 days.⁴⁻⁵ 2) Place in cold stratification in sealed plastic bags for 40-60 days.^{3-5,7,10,12} Gibberellin and KNO₃ substances cannot substitute for stratification.¹⁴
Growing Area Preparation / Annual	Taylorville Sandy clay loam and sand clay loam, with Cca horizons' shallower and deeper than 12". ⁴

Practices for Perennial Crops	To prepare growing site, 0-45-0 (N:P:K) fertilizer applied in April, sulfur applied during May, 2-3" compost applied prior to sowing. ⁴
Establishment Phase Details	Sow seeds in late-spring. ⁴ Aim for a planting depth of ½", but ¼" deeper in moister or finer soils and ¼" shallower in dry or coarser soils. ^{4,13} Germination can be encouraged by the presence of charred wood or aqueous extracts of it. ³ When planting, aim for a density of 18 seedlings/square foot ⁴ or 25 seeds per linear foot. ¹³ Lightly cover and provide irrigation on warm days. ⁴
Length of Establishment Phase	Between 2 to 4 weeks ^{4-5,13}
Active Growth Phase	During the second week of each month of the active growing season (April to August), fertilize with Morgro 21:0:0 NPK. ⁴ Apply at 120 lbs/acre. If apply sulfur or 0:45:0 NPK, must be mechanically incorporated into soil. ⁴ Root pruning may be performed after plants reach 10-12" tall. ⁴ Be careful to maintain heavy irrigation before and after this pruning. ⁴
Length of Active Growth Phase	8 to 10 weeks (Spring) ^{4-5,12}
Hardening Phase	Begin hardening during the third week of August by reducing irrigation frequency and duration. ⁴ Apply incrementally increasing water stresses by decreasing watering frequency and duration, with additional watering only as needed. ⁴⁻⁵ Stop fertilizer application after August 28 th . ⁴
Length of Hardening Phase	8 to 10 weeks (late August to early fall) ⁴⁻⁵
Harvesting, Storage and Shipping	Harvest dormant seedlings mid-Nov. by undercutting with a lifter, then hand-lifting. ⁴ Grade and create bundles of 25, then "heel in" to sandy soil. ⁴ Lift in spring, prior to dormancy breaking, and store on stacked pallets. ⁴ Place in cold storage (36-42 degrees F) with a relative humidity of 92 to 98% with good air circulation. ^{2,4}
Length of Storage	No information.
Guidelines for Outplanting / Performance on Typical Sites	Skunkbush intolerance of crowding (and decreased survival with seeded grass competitors) should be considered during outplanting. ¹² Aim for a planting density between 680 and 2728 per acre. ¹²

	Stand development is reportedly slow: with poor initial establishment and 10+ years being required to attain maturity. ¹³
PROPAGATION DETAILS: FROM SEED -- Container	
Container practices that differ from bareroot seeding practices are listed in the following section. Information consistent for both methods of seed propagation is <i>not</i> reproduced below to avoid redundancy, and should be referenced from the previous section.	
Ecotype	N/A
Propagation Goal	Plants ⁵
Propagation Method	Seed ⁵
Product Type	Container (plug) ⁵
Stock Type	164 mL conetainers ⁵
Time to Grow	Weeks ⁵
Target Specifications	15-25 cm, firm root plug ⁵
Propagule Collection Instructions	N/A. Seeds obtained commercially. ⁵
Propagule Processing/Propagule Characteristics	<i>Refer to previous section.</i>
Pre-Planting Propagule Treatments	<i>Refer to previous section.</i>
Growing Area Preparation / Annual Practices for Perennial Crops	Growing media: 2:1:1 (v:v:v) peat moss: perlite: vermiculite mixture. ⁵ Controlled release 14:14:14 NPK 3-4 month incorporated into media at 4 kg/m ³ . ⁵ Place seeds on media, cover with 2-5 mm perlite. ⁵
Establishment Phase Details	Keep containers very moist with regular misting until vigorous growth apparent, then switch to frequent irrigation. ⁵ No supplemental light provided, temperatures between 12-21 (night) and 15-26 (day) degrees Celsius. ⁵ After 2 weeks: thin to 1 seedling/cell. ⁵
Length of Establishment Phase	Between 2 to 4 weeks ^{4-5,13}
Active Growth Phase	Keep seedlings in greenhouse with temperatures between 18-26 degrees Celsius. ⁵ In addition to the ambient photoperiod, provide 60 minutes of supplemental light during the middle of the night (10-14 hour dark cycle). ⁵ Irrigate every 3-4 days until rooting is complete, then slowly increase frequency to ever 1-2 days. ⁵ Accompany irrigation with application of 20:10:10 NPK liquid fertilizer (25 ppm N for the first 2 weeks, increase by 25 ppm N every two weeks, up to 174 ppm N). ⁵

	Once seedlings reach 25 - 30 cm in height, transfer plants to outdoors shade house. ⁵ Irrigated every other day, no supplemental fertilizer or artificial temperature or light provided. ⁵
Length of Active Growth Phase	8 to 10 weeks (Spring) ^{4-5,12}
Hardening Phase	<i>Refer to previous section</i>
Length of Hardening Phase	8 to 10 weeks (late August to early fall) ⁴⁻⁵
Harvesting, Storage and Shipping	Overwinter seedlings in cold frame to avoid freeze/thaw damage to seedlings. ⁵ Temperatures between 2-4 degrees Celsius, no supplemental light necessary, and irrigate as needed. ⁵ Remove from cold frame when ready to ship (roughly late Feb. – early March). ⁵
Length of Storage	5 months ⁵
Guidelines for Outplanting / Performance on Typical Sites	<i>Refer to previous section.</i>
Other Comments	<i>R. trilobata</i> plants reportedly can be readily reproduced via softwood stem and root cuttings, ¹²⁻¹³ however further details on these propagation methods were not found.
INFORMATION SOURCES	
References	<p>[1] Allen-Cantú, J., Claverie, F., McNelis, P., & Mount, A. (2018). Propagation protocol for production of Container (plug) <i>Rhus trilobata</i> Nutt. Plants Borderlands Restoration Patagonia, Arizona. Native Plant Network; US Department of Agriculture, Forest Service, National Center for Reforestation, Nurseries, and Genetic Resources. https://nnp.rngr.net/renderNPNProtocolDetails?selectedProtocolIds=rhus-trilobata-rhus</p> <p>[2] Barner, J. (2009). Propagation protocol for production of Propagules (seeds, cuttings, poles, etc.) <i>Rhus trilobata</i> Nutt. seeds USDA FS - R6 Bend Seed Extractory Bend, Oregon. Native Plant Network; US Department of Agriculture, Forest Service, National Center for Reforestation, Nurseries, and Genetic Resources. https://nnp.rngr.net/renderNPNProtocolDetails?selectedProtocolIds=anacardiaceae-rhus-3318</p> <p>[3] Baskin, J. M., & Baskin, C. C. (2002). Propagation protocol for production of Container (plug) <i>Rhus trilobata</i> Nutt. plants University of Kentucky Lexington, Kentucky. Native Plant Network; US Department of Agriculture, Forest Service, National Center for Reforestation, Nurseries, and Genetic Resources. https://nnp.rngr.net/renderNPNProtocolDetails?selectedProtocolIds=anacardiaceae-rhus-1962</p>

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