

Plant Propagation Protocol for *Trillium kurabayashii*

ESRM 412 – Native Plant Production

URL: <https://courses.washington.edu/esrm412/protocols/2022/TRKU.pdf>



Trillium kurabayashii, Photo by: Kjirsten Wayman. Via Pacific Bulb Society.

TAXONOMY	
Plant Family	
Scientific Name	Liliaceae
Common Name	Lily

Species Scientific Name	
Scientific Name	<i>Trillium kurabayashii</i> J.D. Freeman
Varieties	No varieties recognized by USDA ¹⁰
Sub-species	No subspecies recognized by USDA ¹⁰
Cultivar	No cultivars recognized by USDA ¹⁰
Common Synonym(s)	<i>Trillium kurabayashii</i> f. <i>luteum</i> V.G.Soukup ¹⁰
Common Name(s)	Giant purple wakerobin or giant purple trillium
Species Code	TRKU
GENERAL INFORMATION	
Geographical range	Southwestern Oregon to northern California Curry County Oregon through Humboldt County California ^{3, 10} . Specimens have also been sighted in Redwoods National Park ¹⁰ . Sierra Nevada Mountains from Butte County to Placer County California ³ .



Map of *Trillium kurabayashii* range from USDA Plant Database¹⁰

Ecological distribution	<p>Wet river drainage areas. River valleys and flood plains on the margins of wet forests. Includes a range of forests including wet mixed conifer-hardwood forests and deciduous flatwoods⁴. Also found in open oak grasslands²</p> <p><i>T. Kurabayashii</i> has had two distinct subpopulations identified in its range, Coastal and Sierra Nevada mountains⁵. Coastal and Sierra Nevada</p>
Climate and elevation range	<p>Coastal: 20-500+ meters Sierra Nevada: 0-1500 meters⁷</p>
Local habitat and abundance	<p>Forested riparian areas and watersheds² Commonly grows in understory of <i>Alnus rubra</i>, <i>Acer circinatum</i> and at the margins of Sequoia groves^{2,3}.</p>

	Grazed by deer and rodents ³
Plant strategy type	Stress-tolerater <ul style="list-style-type: none"> • Tolerant of wet conditions and deep shade³.
Plant characteristics	A <i>Trillium</i> species with sessile flowers (subgenus <i>Phyllantherum</i>) ^{2, 3} . Large, up to 2.5-5.5 dm tall ³ . Herbaceous understory species that forms clumps of rhizomatous plants ^{2, 10} . Leaves are large, 8-22 cm by 12-17 cm, and slightly mottled and glossy bright green ³ . Blooms in late March to early May ² Flowers are upright, dark purple-red, 40-75 x 10-14 mm ² .
PROPAGATION DETAILS: Seed	
Ecotype	Coastal sub-population or Sierra Nevada sub-population
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Container
Stock Type	Seedling in 4 inch pot ⁸
Time to Grow	<i>Trillium</i> seedlings may take 4-7 years to mature to an outplantable stage ^{4, 8}
Target Specifications	Seedlings should be approximately 10 cm high with well-developed whirl of leaves ⁴ .
Propagule Collection Instructions (how, when, etc.)	Seeds should be collected in early to late July when ripe and capsules are about to split ⁴ . Alternately, some recommendations point to collecting seeds in winter, possibly as a means of cutting down on the required cold exposure ⁹ . Seeds are not required to be fully ripe, slightly underripe seeds have shown little decrease in germination success ³ .
Propagule Processing/Propagule Characteristics	Seeds may survive for multiple years if kept in appropriately cool-damp conditions ³ . Storing seeds in dry conditions can result in a deeper state of dormancy requiring additional stratification to break ⁶ .
Pre-Planting Propagule Treatments	<ul style="list-style-type: none"> • Elaiosome removal by soaking for 15 minutes in 3% hydrogen peroxide solution is recommended to decrease the likelihood of seed loss to mold infections and rot³.

	<ul style="list-style-type: none"> • Seeds should then be stored in moist conditions before being washed, re-sterilized³ <p>Up to 2 years from seed collection to germination, depending on the need for stratification⁶.</p> <ul style="list-style-type: none"> • Seeds require at least two cycles of cold-warm-cold stratified and germinate at around 10-20 degrees C^{1,3}. • If allowed to enter a deeper dormancy stage by drying out additional stratification cycles and up to 3 years may be required for germination^{5,3}. • 83 day cold period is required for germination of most <i>Trillium</i> seeds^{3,8}
Growing Area Preparation / Annual Practices for Perennial Crops	<p>Plug trays (4.2x4.2x5.6 cm plugs)⁴. Media: 1:1 Sphagnum peat moss and perlite Mist bench or similar partially shaded area in greenhouse or cold-frame</p> <ul style="list-style-type: none"> • Ideally 80% shaded⁴ • Plants should be transferred to unheated shade-house for cool season cold exposure/hardening⁴
Establishment Phase Details	<ul style="list-style-type: none"> • Plants should be watered regularly to maintain relatively moist conditions^{4,8} • Maintain partial shade³
Length of Establishment Phase	<ul style="list-style-type: none"> • 1-2 years⁸
Active Growth Phase	<ul style="list-style-type: none"> • Up pot plants to 10x10x10 cm (4-inch) pots once characteristic <i>Trillium</i> three leaf whirl has formed and cotyledons have dropped⁸ • Media should be replaced with Scott's Metro-mix 560 with ScottsCoir⁸ • Plants should be watered frequently • Keep in 80% shade⁴ • Shift to shaded outdoor space to avoid excessive greenhouse temperatures and risk of desiccation⁸ • Fertilize twice yearly with granular fertilizer in early spring and when flowering finishes⁸
Length of Active Growth Phase	About 1 year or until next cold period after germination ⁸

Hardening Phase	<ul style="list-style-type: none"> • Continue regular watering • Maintain shaded conditions^{4,8}
Length of Hardening Phase	3 months From end of flowering in May to foliage die off in August ^{3, 4} .
Harvesting, Storage and Shipping	Potted plants should be kept moist and shaded to the extent possible while transporting to outplanting site ^{4,8} .
Length of Storage	1-2 years depending on desired size/maturity of outplanting
Guidelines for Outplanting / Performance on Typical Sites	<ul style="list-style-type: none"> • Outplant in fourth Spring after sowing⁴ • Depending on age at outplanting 1-3 years of further growth may be required for flowering to occur^{3, 4, 8} • Plant in moist but well drained soils in well-shaded understory³
Other Comments	<ul style="list-style-type: none"> • <i>T. kurabayashii</i> is considered to be a vulnerable species and seed harvest should be conducted with care to not jeopardize existing populations⁵. • Special permission may also be required to harvest trillium seeds depending on the state and locality³ • Illegal commercial harvest of trillium rhizomes presents a risk to <i>T. kurabayashii</i> and should be kept in mind when selecting where to outplant³ for restoration or conservation. • Due to the limited body of formal research on propagation of <i>Trillium kurabayashii</i> this protocol draws on practices established for western North American <i>Trillium</i> species as a group^{3,4,8}. • Details for <i>T. kurabayashii</i> phenology and characteristic were used to adapt existing protocols for PNW trillium species using times for each stage in line with this species growth patterns^{2, 3}
INFORMATION SOURCES	
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