

Plant Propagation Protocol for [*Solanum triflorum*]

ESRM 412 – Native Plant Production

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TAXONOMY	
Plant Family	
Scientific Name	<i>Solanaceae</i> Juss (11)
Common Name	Potato Family (11)
Species Scientific Name	
Scientific Name	<i>Solanum triflorum</i> (11)
Varieties	N/A
Sub-species	N/A
Cultivar	<i>Solanum triflorum</i> Nutt.
Common Synonym(s)	Is sometimes confused with <i>Solanum dulcamara</i> (8).
Common Name(s)	Small nightshade Cutleaf nightshade
Species Code (as per USDA Plants database)	SOTR
GENERAL INFORMATION	
Geographical range	Occurring chiefly east of the Cascades crest in Washington; British Columbia to California, east across most of North America to the Atlantic Coast. (10)
Ecological distribution	Found on disturbed sites, roadsides, streamside's, often in sandy soil (6).
Climate and elevation range	Between sea level and 2,300 (-2,900) m elevation in its native range, between sea level and 1,800 m in the introduced range (9). Can survive in wide range of climate: Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: mildly acid, neutral and basic (mildly alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil (5).
Local habitat and abundance	Mesic to dry waste places, roadsides and fields in the lowland and steppe zones; infrequent in S BC; introduced from S America (2). The plant grows better in cultivated ground, and it grows best of all in situations particularly suited to the development of <i>S. tuberosum</i> (1).

Plant strategy type / successional stage	Weedy/Colonizer
Plant characteristics	<p>In Arizona & New Mexico range: PLANT: Annual herbs, 10-50 cm tall, unarmed, without tubers or stolons, sparsely to densely appressed pubescent; stems divergent, spreading to decumbent. LEAVES: simple, alternate, oblong to ovate, deeply pinnatifid, 2-5 cm long, 1-2 cm wide, ca. 2 times as long as wide, with individual lobes lanceolate, the blade submembranous; petiole 5-20 mm long; apex acute; base cuneate. INFLORESCENCE: umbels with (1-)2-3(-6)-flowered; peduncle 5-15 mm long. FLOWERS: actinomorphic (Fig. 3E); pedicel up to 5 mm long; calyx 2.5-5 mm long, campanulate, the lobes longer than tube, linear, acute; corolla white, drying yellow, up to 8 mm wide; stamens equal; anthers 2.5-3 mm long, not adherent, straight; filaments about as long as anthers; style about as long as stamens. FRUITS: 9-14 mm in diam., green, ascending, not enclosed by calyx; seeds 2.5-3 mm in diam., many, sub-orbicular, flat, yellow-brown. (6)</p> <p>In Washington range: Leaves: Leaves short-petiolate, pinnately lobed, the blade 2-5 cm. long and 1-3 cm. wide, the rachis about equal in length to the lobes.</p> <p>Flowers: Inflorescence of several ascending, stout, few-flowered peduncles, 0.5-2.5 cm. long, attached along the stem or opposite the leaves, the pedicels drooping, clustered; calyx tube short, the 5 narrow lobes unequal, up to 6 mm. long at maturity, the tips reflexed; corolla white, rotate, 5-9 mm. wide, the 5 lobes deeply divided; stamens 5, the anthers prominent, yellow; style solitary; ovary superior.</p> <p>Fruits: Fruit a greenish, globose berry, 9-14 mm. thick. (10)</p>
PROPAGATION DETAILS: FROM SEED	
Ecotype	N/A
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Container (Plug) (7)
Stock Type	N/A
Time to Grow	1 year
Target Specifications	Root System: Firm root plug in the container
Propagule Collection Instructions	Seed - sow spring in a greenhouse. When they are large enough to handle, prick the seedlings out into individual pots and plant them out after the last expected frosts (5).

Propagule Processing/Propagule Characteristics	Cleaning fleshy fruit: To prepare seeds from fruit that is fleshy or pulpy, place ripe fruits in a bucket or bowl of water and gently separate seeds from pulp by mashing or massaging fruit. Pour off remaining water and pulp. Seeds are ready to be sown. If storing seeds, dry well before storage, and store in cool, dry place. Seeds can be stored, if necessary. (7)
Pre-Planting Propagule Treatments	No soaking is necessary. Plant seeds about 1/8 " deep. Once seeds are ready to be sown, prepare seed tray or pots with well drained potting mix. Seeds can be sown in pots or trays. Seed trays are preferred because they will allow for proper development of roots and easy up-potting. Wet down tray before sowing. Sow seeds evenly on tray or pots. A general rule of seed sowing is to sow them as deep, or up to 3 times as deep, as seed diameter. Water well and evenly. (7)
Growing Area Preparation / Annual Practices for Perennial Crops	The nursery's irrigation system is comprised of sprinkler heads which are manually operated. The sprinklers are misters and should be maintained so that they flow freely. Potted plants are watered daily, either in the morning or the evening. Potting media is Sunshine Mix potting soil, and is used in a 2 to 1 or 3 to 1 (v:v) potting soil to sand ratio. Diseases and insects are controlled by removing them manually off plants, sticky traps or using a solution of soapy water. Be sure to rinse soapy solution off plants after a few hours. Row covers physically prevent insects and birds from landing on plants. (7)
Establishment Phase Details	Seeds germinate usually within a month. Transplanting seedlings: Seedlings will be ready to up-pot from trays when they have at least 2 sets of mature leaves. Use a pencil or your fingers to gently pry each seedling apart from others, try to touch or injure roots as little as possible (7).
Length of Establishment Phase	2 months (7).
Active Growth Phase	N/A
Length of Active Growth Phase	8-10 months (7).
Hardening Phase	N/A
Length of Hardening Phase	N/A
Harvesting, Storage and Shipping	Collect the berries using clippers or by hand and store them in a shed for a week until they become soft. Use a grinder to grind the fruit. Filter the crushed berries using a strainer to remove most of the skin and pulp. Allow seeds to settle at the bottom. Repeat this cleaning process until the seeds are clean. Then dry the seeds, transfer them into a fine net bag and use towels to absorb the excess water. Elevate seeds above ground to allow them to dry for 2-5 hours. Then transfer the seeds into a cool and ventilated space for 2 weeks away from sunlight. (3)

	Long term storage requirements: Low humidity (relative humidity <45%), Temperatures below 15 degrees Celsius, and No sunlight. Use a airtight container to keep the seeds dry (3)
Length of Storage	Up to 5 years
Guidelines for Outplanting / Performance on Typical Sites	N/A
Other Comments	<p>The Blackfoot Nation has used cutleaf nightshade for medicine to treat childhood diarrhea and stomach aches by using a decoction from the berries. Cutleaf nightshade has also been used as a food source. Although toxicity is not known in humans for this species, it is in the same genus as many other species with toxic leaves and fruit. Horses and hamsters have had reactions to the toxicity. (12)</p> <p>Edible parts of Cutleaf Nightshade:</p> <p>Fruit - raw or cooked. Used in times of food shortage. Eaten as a fruit or vegetable, the fruit can also be dried, ground into a powder and used with cereals for making bread etc. The ripe fruit can be boiled, mashed and mixed with ground chilli and salt then used as a condiment with mush or bread (4).</p>
INFORMATION SOURCES	
References	<ol style="list-style-type: none"> 1. Anderson, F. W. "Solanum triflorum Nutt." <i>Botanical Gazette</i> 12.12 (1887): 296-296. 2. "E-FLORA BC: ELECTRONIC ATLAS OF THE FLORA OF BRITISH COLUMBIA Solanum Triflorum Nutt. Cut-Leaved Nightshade (Cutleaf Nightshade) Solanaceae (Potato Family)." <i>No Atlas Page Present</i>, linnet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Solanum%2Btriflorum. Accessed 21 May 2024. 3. "How to Save Nightshade Seed." <i>YouTube</i>, YouTube, 13 July 2016, www.youtube.com/watch?v=KhdUVVyawes&t=187s. 4. "Medicinal Herbscutleaf Nightshadesolanum Triflorum." <i>Medicinal Herbs: CUTLEAF NIGHTSHADE - Solanum Triflorum</i>, www.naturalmedicinalherbs.net/herbs/s/solanum-triflorum=cutleaf-nightshade.php. Accessed 21 May 2024. 5. <i>Pfaf Plant Search</i>, pfaf.org/user/Plant.aspx?LatinName=Solanum%2Btriflorum. Accessed 21 May 2024. 6. <i>SEINet Portal Network - Solanum Triflorum</i>, swbiodiversity.org/seinet/taxa/index.php?taxon=3842&clid=80#:~:text=Solanum%20triflorum%20Nutt.&text=PLANT%3A%20Annual%20herbs%2C%2010%2D,%2D2%20cm%20wide%2C%20ca. Accessed 21 May 2024. 7. "Solanaceae (Solanum)." <i>RNGR</i>, rngr.net/npn/propagation/protocols/solanaceae-solanum-2666. Accessed 21 May 2024.

	<p>8. “Solanum Triflorum - Cut-Leaved Nightshade.” <i>Native Plant Trust: Go Botany</i>, gobotany.nativeplanttrust.org/species/solanum/triflorum/. Accessed 21 May 2024.</p> <p>9. “Solanum Triflorum Nutt., Gen. N. Amer. Pl. 1: 128. 1818.” <i>Solanum Triflorum Nutt., Gen. N. Amer. Pl. 1: 128. 1818 - Plazi TreatmentBank</i>, treatment.plazi.org/id/F5723DE7558EE405BADD9D26CDF11684. Accessed 21 May 2024.</p> <p>10. WTU Herbarium, Burke Museum. <i>Solanum Triflorum - Burke Herbarium Image Collection</i>, burkeherbarium.org/imagecollection/taxon.php?Taxon=Solanum+triflorum#:~:text=Solanum%20triflorum%20%2D%20Burke%20Herbarium%20Image%20Collection&text=Distribution:%20Occurring%20chiefly%20east%20of,at%20low%20to%20moderate%20elevations. Accessed 21 May 2024.</p> <p>11. <i>USDA Plants Database</i>, plants.usda.gov/home/plantProfile?symbol=SOTR. Accessed 21 May 2024.</p> <p>12. “Cutleaf Nightshade (Plants of the Middle Rio Grande Bosque) · Inaturalist.” <i>iNaturalist</i>, www.inaturalist.org/guide_taxa/1005252. Accessed 21 May 2024.</p>
Other Sources Consulted	<p>“Integrated Taxonomic Information System - Report.” <i>ITIS</i>, www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=30461#null. Accessed 21 May 2024.</p> <p>“Solanum Triflorum - Cut-Leaved Nightshade.” <i>Native Plant Trust: Go Botany</i>, gobotany.nativeplanttrust.org/species/solanum/triflorum/. Accessed 21 May 2024.</p> <p><i>Solanum Triflorum Photos Saskatchewan Wildflowers</i>, www.saskwildflower.ca/nat_Solanum-triflorum.html. Accessed 21 May 2024.</p>
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