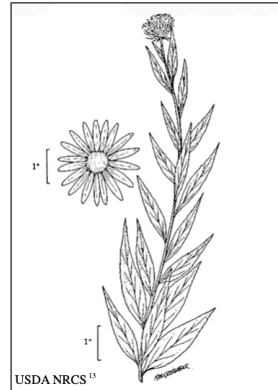


Plant Propagation Protocol for Nuttall's sunflower (*Helianthus nuttallii*)

ESRM 412 – Native Plant Production

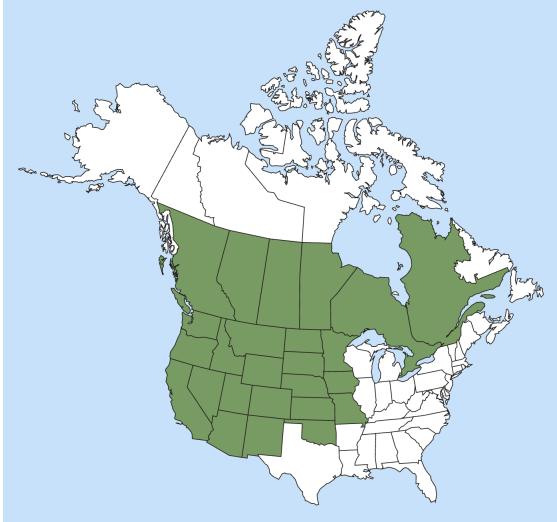
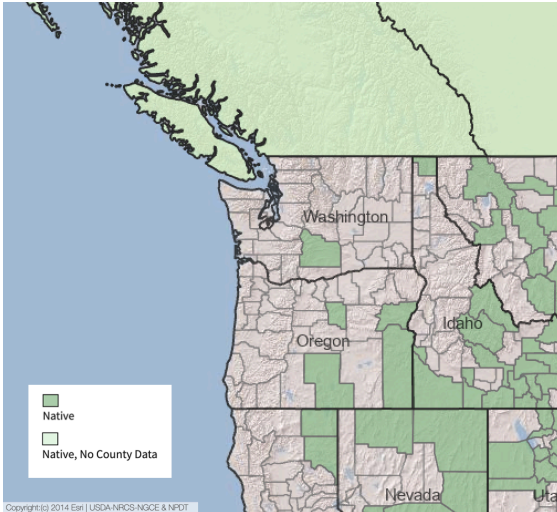
URL: <https://courses.washington.edu/esrm412/protocols/2026/HENU.pdf>



TAXONOMY	
Plant Family	
Scientific Name	Asteraceae
Common Name	Aster Family
Scientific Names	
Scientific Name	<i>Helianthus nuttallii</i> Torr. & A. Gray
Varieties	Varieties not recognized in USDA PLANTS database.
Sub-species	<i>Helianthus nuttallii</i> Torr. & A. Gray subsp. <i>nuttallii</i> ¹ <i>Helianthus nuttallii</i> Torr. & A. Gray subsp. <i>rydbergii</i> (Britton) R.W. Long ¹ <i>Helianthus nuttallii</i> Torr. & A. Gray subsp. <i>parishii</i> (A. Gray) Heiser ¹
Cultivar	No cultivars recognized for this species
Common Synonym(s)	<i>Helianthus fascicularis</i> Greene ¹⁰ <i>Helianthus coloradensis</i> Cockerell ¹⁰ <i>Helianthus bracteatus</i> E.E. Watson ¹⁰ <i>Helianthus utahensis</i> A. Nelson ¹⁰
Common Name	Nuttall's sunflower

Species Code	HENU
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GENERAL INFORMATION

Geographical range	 <p>[2]</p>  <p>[4]</p>
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Ecological distribution	<p><i>Helianthus nuttallii</i> occurs in a variety of open habitats across its range, including moist prairies, wet meadows, riparian zones, and disturbed areas such as roadsides and ditches. The species is typically associated with open, sunny environments and occurs</p>
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	<p>primarily in moist habitats, though some subspecies tolerate both wet and dry conditions. ^{2,9}</p>
Climate and elevation range	<p>This species is distributed across temperate regions of North America and occurs over a broad elevational range (~200–2700 m). Lower elevations are typically associated with wet meadow and riparian systems, while higher elevations occur in montane meadows and open slopes. ²</p>
Local habitat and abundance	<p><i>Helianthus nuttallii</i> grows in dry to wet open areas, including prairies, subalpine meadows, sedge meadows, swales, springs, streams and riverbanks, swamps, open slopes, and disturbed habitats, such as ditches and roadsides. ^{6,7}</p> <p>In Washington, Oregon, and Idaho, it is commonly associated with wetland and riparian species such as <i>Typha latifolia</i>, <i>Scirpus</i> spp., <i>Carex</i> spp., <i>Juncus tenuis</i>, <i>Eleocharis</i> spp., and <i>Berula erecta</i>. It also occurs in drier systems including sagebrush steppe and upland disturbed sites, where it co-occurs with <i>Artemisia tridentata</i>, <i>Bromus tectorum</i>, <i>Pseudoroegneria spicata</i>, and <i>Ericameria</i> spp. ³</p>
Plant strategy type / successional stage	<p>Based on its occurrence in open and frequently disturbed habitats, <i>Helianthus nuttallii</i> can be characterized as an early- to mid-seral species. It functions as a colonizer of disturbed or open sites and is adapted to environments with moderate resource availability. Its ability to establish in both moist and well-drained soils suggests a flexible ecological strategy. ^{3,9} The species may reproduce both by seed and vegetatively through rhizomes, allowing it to persist and spread in suitable habitats. It is adapted to open, sunlit environments and exhibits traits typical of perennial herbaceous species in temperate ecosystems. ^{1,2}</p>
Plant characteristics	<p><i>Helianthus nuttallii</i> is a perennial forb with yellow composite flower heads, thick, tuber-like roots and</p>

	short rhizomes. Stems vary from smooth to slightly hairy in texture and, 0.5 - 4.0 m. in height ¹⁰ . Leaves are variable in arrangement (opposite to alternate), typically lance-shaped, and may be smooth or rough-textured. Flower heads have small central disks (1–2 cm diameter) with narrow bracts. ⁹
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PROPAGATION DETAILS: FROM SEED

Ecotype	Seed source for <i>Helianthus nuttallii</i> is not documented in any species-specific protocols. A related protocol for <i>Helianthus occidentalis</i> used seed from Central Illinois (~650 ft elevation). ⁴ For this protocol, seed is assumed to be sourced from low- to mid-elevation populations in moist meadow and riparian habitats of the Pacific Northwest. ^{2,3}
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Container (plug)
Stock Type	1+0 container plugs (herbaceous perennial forb). ⁴
Time to Grow (time from seeding until plants are ready to be outplanted)	Approximately 8–11 months from sowing to outplanting under greenhouse production systems. ⁴
Target Specifications	Healthy perennial plugs with a well-developed fibrous root system and multiple true leaves, typically 3' - 8' (90cm - 240cm) in height at outplanting. Plants may require staking when grown in exposed locations. ⁸
Propagule Collection Instructions	Seeds are collected from mature capitula in late summer to early fall when achenes (cypselas) are fully developed and easily dislodged. ⁵ Flower heads are hand-harvested directly from production plants and air-dried prior to cleaning to allow seed separation from floral material. ⁴ Herbarium records from the Consortium of Pacific Northwest Herbaria indicate that flowering and fruiting in wild populations of

	<p><i>Helianthus nuttallii</i> typically occur during the same late summer to early fall period across much of its regional range. ³</p>
<p>Propagule Processing/Propagule Characteristics</p>	<p>Seeds are small achenes typical of the Asteraceae family, seed density is approximately 125,000 seeds per pound. ¹ After drying, seeds are mechanically cleaned using screens and gravity separation equipment to remove chaff and non-viable material, resulting in approximately 82% seed purity. Seeds exhibit physiological dormancy and require a cold-moist stratification period of 3–4 months at 34–36°F to improve germination. Seed material is typically stored under cool conditions (approximately 40–50°F) prior to sowing to maintain viability. ⁴</p>
<p>Pre-Planting Propagule Treatments</p>	<p>Cold moist stratification is recommended for 8–16 weeks at 1–4°C to improve germination uniformity. Seeds are stored dry and cool prior to stratification. No scarification is typically required for <i>Helianthus</i> species. ⁴</p>
<p>Growing Area Preparation / Annual Practices for Perennial Crops</p>	<p>Seeds are sown in plug trays using a sterile, well-drained propagation medium (peat or peat alternative with perlite/vermiculite amendments). Seeds are lightly covered with substrate and maintained under high light greenhouse conditions with careful irrigation to prevent displacement. ⁴</p>
<p>Establishment Phase Details</p>	<p>Seeds are germinated under warm greenhouse temperatures (18–25°C) with consistent moisture. Germination typically occurs under high light conditions with careful irrigation management to avoid damping-off. ⁴</p>
<p>Length of Establishment Phase</p>	<p>Approximately 2–3 weeks. ⁴</p>
<p>Active Growth Phase</p>	<p>Seedlings are grown under full light with increasing fertility over time (low to moderate nitrogen liquid fertilizer). Plants are thinned to reduce competition</p>

	and may be pruned to maintain compact, sturdy growth in plug systems. ⁴
Length of Active Growth Phase	Approximately 5–8 months depending on production schedule and container system. ⁴
Hardening Phase	Seedlings are gradually acclimated to outdoor conditions by reducing irrigation and fertilizer inputs and exposing plants to cooler temperatures in shadehouse or hoop house conditions prior to outplanting. ⁴
Length of Hardening Phase	Approximately 3–6 weeks. ⁴
Harvesting, Storage and Shipping (of seedlings)	Plugs may be stored briefly under cold conditions (just above freezing) prior to outplanting. Storage must prevent desiccation and is typically short-term. ⁴
Length of Storage	Approximately 1–4 months under cold storage conditions. ⁴
Guidelines for Outplanting / Performance on Typical Sites	Outplant in moist soils during spring or fall in open to partially open habitats. Highest success occurs in wet meadow and riparian restoration sites with low to moderate competition. Flowering may occur within 2–3 years depending on site conditions. ^{2,3}
Other Comments	<p>Propagation information for <i>Helianthus nuttallii</i> is supplemented with data from the closely related species <i>Helianthus occidentalis</i>. Among <i>Helianthus</i> species with existing protocols, <i>H. occidentalis</i> provides the most comparable reference because of its similar growth form and habitat affinity.</p> <p>This species has been shown to regenerate from single cells under controlled laboratory conditions, indicating potential for propagation via tissue culture and somatic embryogenesis.¹⁰</p>

INFORMATION SOURCES

References

[1] United States Department of Agriculture, Natural Resources Conservation Service (USDA NRCS). 2026. The PLANTS Database: *Helianthus nuttallii* (HENU). Greensboro, NC: National Plant Data Team. Available at: <https://plants.sc.egov.usda.gov/plant-profile/HENU>(accessed April 25, 2026).

[2] Flora of North America Editorial Committee. 1993–present. Flora of North America North of Mexico. Oxford University Press, New York & Oxford. Available at: <http://floranorthamerica.org> (accessed April 26, 2026).

[3] Consortium of Pacific Northwest Herbaria (CPNWH). 2026. Specimen database search: *Helianthus nuttallii*. Available at: <https://www.pnwherbaria.org/data/results.php> (accessed April 26, 2026).

[4] Blessman, G., Flood, R.M., and Horvath, D.J. 2001. Propagation protocol for production of container (plug) *Helianthus occidentalis* Riddell plants (1+0 container plugs). Illinois Department of Natural Resources, Mason State Nursery. In: Native Plant Network. Available at: <https://NativePlantNetwork.org> (accessed April 26, 2026).

[5] Lady Bird Johnson Wildflower Center. n.d. *Helianthus nuttallii* (Nuttall's sunflower) plant database. University of Texas at Austin. Available at: https://www.wildflower.org/plants/result.php?id_plant=HENU (accessed April 26, 2026).

[6] Calflora Database. 2000. Information on California plants for education, research and conservation. Berkeley, California. Available at: <https://www.calflora.org> (accessed April 26, 2026).

	<p>[7] OregonFlora. 2026. Helianthus nuttallii species account. Oregon State University. Available at: https://oregonflora.org/taxa/index.php?taxon=5527 (accessed April 27, 2026).</p> <p>[8] Gardenia. 2026. Helianthus nuttallii (Nuttall’s sunflower) plant profile. Gardenia.net. Available at: https://www.gardenia.net/plant/helianthus-nuttallii (accessed April 27, 2026).</p> <p>[9] Heiser, C.B., Smith, D.M., Clevenger, S.B., and Martin, W.C. Jr. 1969. The North American sunflowers (Helianthus). <i>Memoirs of the Torrey Botanical Club</i> 22(3): 1–218. (accessed April 27, 2026).</p> <p>[10] Henn, H.J., Wingender, R., and Schnabl, H. 1998. Regeneration of fertile plants from Helianthus nuttallii and Helianthus giganteus mesophyll protoplasts. <i>Plant Cell Reports</i> 18: 288–291. https://doi.org/10.1007/s002990050573 (accessed April 27, 2026).</p> <p>[11] Duft, J. F. 1992. <i>Western wetland flora: Field office guide to plant species</i>. USDA Natural Resources Conservation Service, Wetland Science Institute (WSI), Sacramento, CA.</p> <p>[12] Steve Hurst. Provided by ARS Systematic Botany and Mycology Laboratory. United States Nevada</p> <p>[13] USDA NRCS, Wetland flora: Field office illustrated guide to plant species.. Provided by NRCS National Wetland Team</p>
Other Sources Consulted	[14] Native American Ethnobotany Database. n.d. Helianthus nuttallii Torr. & A. Gray species use

	<p>record. University of Michigan–Dearborn. Available at: http://naeb.brit.org/uses/16659/ (accessed April 27, 2026).</p> <p>[15] BONAP (Biota of North America Program). 2014. North American Plant Atlas: <i>Helianthus nuttallii</i> distribution summary. Available at: https://bonap.net (accessed April 27, 2026).</p> <p>[16] NatureServe. 2026. NatureServe Explorer: <i>Helianthus nuttallii</i>. Arlington, Virginia. Available at: https://explorer.natureserve.org (accessed April 27, 2026).</p> <p>[17] Henn, HJ., Wingender, R. & Schnabl, H. Regeneration of fertile plants from <i>Helianthus nuttallii</i> T&G and <i>Helianthus giganteus</i> L. mesophyll protoplasts. <i>Plant Cell Reports</i> 18, 288–291 (1998). https://doi.org/10.1007/s002990050573 (accessed April 27, 2026).</p>
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