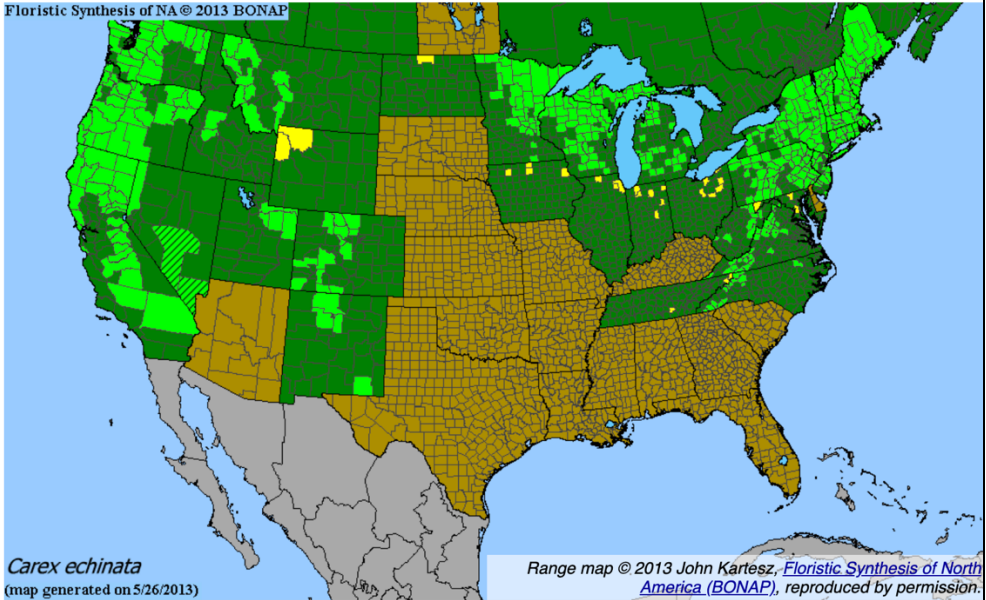


Plant Propagation Protocol for *Carex echinata*

ESRM 412 – Native Plant Production

URL: <https://courses.washington.edu/esrm412/protocols/2023/CAECE>

TAXONOMY	
Plant Family	
Scientific Name	<i>Cyperaceae</i> ⁸
Common Name	Sedge ⁵
Species Scientific Name	
Scientific Name	<i>Carex echinata</i> Murray ⁵
Varieties	N/A
Sub-species	<i>Carex echinata</i> Subsp. <i>Phyllomanica</i> <i>Carex echinata</i> Subsp. <i>echinata</i> Note: More subspecies have been suggested in New England based on perigynia size and spike arrangement but have not yet been generally accepted ⁶
Cultivar	N/A
Common Synonym(s)	<i>Carex angustior</i> Mack. <i>Carex angustior</i> Mack. var. <i>gracilentata</i> R.T. Clausen & Wahl <i>Carex cephalantha</i> (L.H. Bailey) E.P. Bicknell <i>Carex echinata</i> Murray var. <i>angustata</i> (Carey) L.H. Bailey <i>Carex hawaiiensis</i> H. St. John <i>Carex josselynii</i> (Fernald) Mack. ex Pease <i>Carex laricina</i> Mack. ex Bright <i>Carex leersii</i> Willd. <i>Carex muricata</i> L. var. <i>angustata</i> (Carey) Carey ex Gleason <i>Carex muricata</i> L. var. <i>cephalantha</i> (L.H. Bailey) Wiegand & Eames <i>Carex muricata</i> L. var. <i>laricina</i> (Mack. ex Bright) Gleason <i>Carex ormantha</i> (Fernald) Mack. <i>Carex phyllomanica</i> W. Boott var. <i>angustata</i> (Carey) B. Boivin <i>Carex phyllomanica</i> W. Boott var. <i>ormantha</i> (Fernald) B. Boivin <i>Carex svenssonis</i> Skottsbo. ⁹
Common Name(s)	star sedge little prickly sedge ⁷ Igel-Segge [German] Sparrige Segge [German] ³
Species Code (as per USDA Plants database)	CAECE ⁹
GENERAL INFORMATION	

Geographical range	<p>Floristic Synthesis of NA © 2013 BONAP</p>  <p><i>Carex echinata</i> (map generated on 5/26/2013)</p> <p>Range map © 2013 John Kartesz, Floristic Synthesis of North America (BONAP), reproduced by permission.</p> <p>County Color Key: Native, not rare Native, rare Native, adventive Extirpated Extinct Exotic Noxious weed Eradicated Waif Questionable presence</p> <p>State Color Key: Not present Present, native Present, exotic</p> <p>(Kartesz, John)</p>
Ecological distribution	wet forests, marshes, and mountain meadows of moderate elevation ²
Climate and elevation range	Elevation: 9" - 10501" Annual Precipitation: 13.1" - 133.4" Humidity: 0.01" - 24.00" ²
Local habitat and abundance	Bogs, seeps, seepage swamps, depression swamps and ponds at middle to higher elevations. ¹⁰
Plant strategy type / successional stage	As a grass it is a primary successor
Plant characteristics	Perennial sedge with tightly clustered spikes and flowers blooming from late spring to early summer. They have 6 to 12 alternating leaves on the lower third of the stem and a brown sheath at the base of the plant. ⁶
PROPAGATION DETAILS for Genus <i>Carex</i> from Butler et al. 2001¹	
Ecotype	Colorado, Lake Irene (98-161s), Alpine Visitor Center (98-211s, 98-217s)
Propagation Goal	Seeds

Propagation Method	Seed
Product Type	Propagules (seeds, cuttings, poles, etc.)
Stock Type	N/A
Time to Grow	0
Target Specifications	N/A
Propagule Collection Instructions	Seed cleaning technique: Strip seeds from head, seeds may be planted as is, or may need the perigymon removed. To do this, crush with hands or use sandpaper blocks.
Propagule Processing/Propagule Characteristics	N/A
Pre-Planting Propagule Treatments	N/A
Growing Area Preparation / Annual Practices for Perennial Crops	Propagation Environment: Greenhouse, 65-70°F day/55°F night. Propagated under tent with misters set 8 am-8 pm, with 10 sec/15 min watering intervals. One week after germination, seedlings were moved to mister area without tent. Germination Media: Fafard Germinating Mix (Superfine)
Establishment Phase Details	Sowing/planting technique: Sown in small pots, for ease of divisions later.
Length of Establishment Phase	Variable
Active Growth Phase	N/A
Length of Active Growth Phase	N/A
Hardening Phase	N/A
Length of Hardening Phase	N/A
Harvesting, Storage and Shipping	Seed stored in the greenhouse
Length of Storage	N/A

Guidelines for Outplanting / Performance on Typical Sites	N/A
Other Comments	
INFORMATION SOURCES	
References	<p>¹Butler, Jennifer; Frieswyk, Christin. 2001. Propagation protocol for production of Propagules (seeds, cuttings, poles, etc.) Carex seeds USDI NPS - Rocky Mountain National Park Estes Park, Colorado. In: Native Plant Network. URL: https://NativePlantNetwork.org (accessed 2023/05/24). US Department of Agriculture, Forest Service, National Center for Reforestation, Nurseries, and Genetic Resources.</p> <p>²California Native Plant Society. <i>Bristle Fruit Sedge, Carex Echinata</i>. calscape.org/Carex-echinata-(Bristle-Fruit-Sedge)?srchcr=sc58b9017cf2524. Accessed 23 May 2023.</p> <p>³“Carex Echinata - Murray.” Carex Echinata - Murray, eunis.eea.europa.eu/species/187888.</p> <p>⁴Kartesz, John, Floristic Synthesis of North America (BONAP), 2013</p> <p>⁵“Lady Bird Johnson Wildflower Center - the University of Texas at Austin.” <i>Lady Bird Johnson Wildflower Center - the University of Texas at Austin</i>, www.wildflower.org/plants/result.php?id_plant=CAECE.</p> <p>⁶Minnesota Wildflowers. <i>Carex Echinata (Star Sedge): Minnesota Wildflowers</i>. www.minnesotawildflowers.info/grass-sedge-rush/star-sedge#:~:text=There%20are%20currently%20two%20recognized,less%20than%202.8%20mm%20wide. Accessed 24 May 2023.</p> <p>⁷“Star Sedge (Carex Echinata) U.S. Fish and Wildlife Service.” <i>FWS.gov</i>, www.fws.gov/species/star-sedge-carex-echinata.</p> <p>⁸University of California, Berkeley. “Carex Echinata.” <i>The Jepson Herbarium</i>, ucjeps.berkeley.edu/eflora/eflora_display.php?tid=76612. Accessed 23 May 2023.</p> <p>⁹“USDA Plants Database.” <i>USDA Plants Database</i>, plants.usda.gov/home/plantProfile?symbol=CAECE.</p>

	<p>¹⁰WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION. “Carex Echinata.” <i>Star Sedge</i>, dep.wv.gov/WWE/getinvolved/sos/SiteAssets/Pages/WVwetflora/StarSedge.pdf. Accessed 23 May 2023.</p>
Other Sources Consulted	Liao, Chun-kuei (January 2016). "Carex echinata Murray (section Stellulatae: Cyperaceae), a Newly Recorded Sedge in Taiwan". doi:10.7075/TJFS.
Protocol Author	Austin Lincoln Obermeyer
Date Protocol Created or Updated	05/24/2023