

Plant Propagation Protocol for *Carex arcta*
 ESRM 412 – Native Plant Production

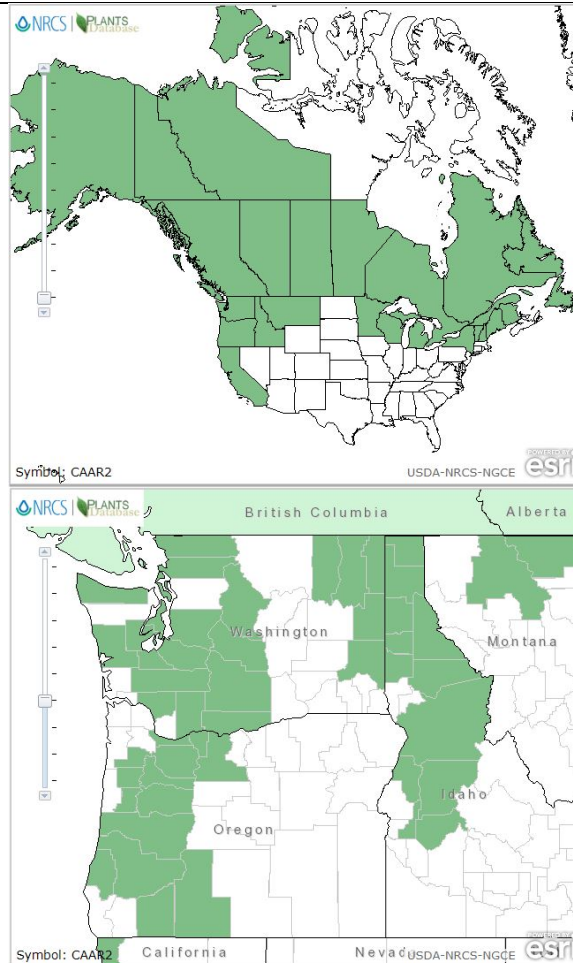


³Carex Arcta Calflora, www.calflora.org/cgi-bin/species_query.cgi?where-calrecnum=1516.

TAXONOMY	
Plant Family	
Scientific Name	CYPERACEAE
Common Name	Sedge Family
Species Scientific Name	
Scientific Name ¹	<i>Carex arcta</i> Boott
Varieties	
Sub-species	
Cultivar	
Common Synonym(s)	
Common Name(s)	Northern cluster sedge, contracted sedge ¹ , bear sedge ⁵
Species Code (as per USDA Plants database)	CAAR2

GENERAL INFORMATION

Geographical range²



Ecological distribution

C. arcta occurs throughout much of the northern U.S. in states such as Washington, Oregon, Idaho, California (along the northern coast), Montana, Maine, Massachusetts, Minnesota, New Hampshire, New York, Vermont, Wisconsin, and Alaska⁶. It can also be found in all the Canadian provinces⁶.

Throughout each of these states, provinces and regions, *C. arcta* grows in sphagnum bogs⁷, wetlands, coniferous swamps, fens, and wet meadows¹¹ often in clearings in the lowland, steppe, and montane zones³.

Climate and elevation range

C. arcta can be primarily found in elevations ranging from 60-1400m⁸ (200-4,600 feet) but can also be found at sea level in some regions⁷.

The climate type for *C. arcta* is highly variable and as such does not have a specified climatic range³.

Local habitat and abundance

In Washington *C. arcta* can be found growing in mesic subalpine forests where depressions in the landscape along with poorly draining soils create boggy meadows, moors and marshes, characterized by *Tsuga mertensiana* as a primary conifer and species such as *Carex aquatilis*, *Salix pedicellaris*, *Vaccinium occidentale*, *Aster occidentalis*,

	<p><i>Eriophorum polystachion</i>, and <i>Kalmia polifolia</i> as the dominant sub-species¹⁰.</p> <p>In Oregon <i>C. arcta</i> is often found growing in <i>Carex-Sphagnum</i> communities in the Subalpine Parklands in central and southern portions of the Cascade Mountain Range¹⁰. The soil is rarely flooded but saturated for most of the year creating a bog-like environment where the dominant species <i>C. arcta</i> grows alongside include <i>Carex rostrata</i>, <i>Eleocharis pauciflora</i>, <i>Epilobium alpinum</i>, <i>Dodecatheon jeffreyi</i>, <i>Saxifraga oregana</i>, <i>Carex scopulorum</i>, <i>Carex illota</i>, and <i>Sphagnum squarrosum</i>¹⁰.</p>
Plant strategy type / successional stage	<i>C. arcta</i> spreads with a caespitose habit through its short rhizomatous roots ⁶ . It can indicate a seral to late successional stage in the ecosystem it is growing in and is considered threatened/endangered in California, Vermont, and New York because of its environmental requirements for success ³ .
Plant characteristics	<p><i>C. arcta</i> is a perennial herb (sedge) that is somewhat tufted and sprouts from elongate fibrous roots, growing 25-60 cm (10-24 inches) in height with leaves roughly the same length³. Its numerous leaves are tight sheaths/blades (1.5-4 mm wide) borne on the lower portion of the stem³.</p> <p>Its bears 5 to 15 flowers in the form of spikes which are 3-5cm long, with narrow, cylindrical/egg-like shaped head; <i>C. arcta</i> has many flowers that are 5-8 mm long and possesses both female and male flowers (the male flowers are beneath the female but are inconspicuous)³.</p> <p>Fruits on <i>C. arcta</i> are colored brown, dark green or green with whitish dots and take a 2.2-3.5mm long egg-shape³.</p>
PROPAGATION DETAILS	
Ecotype	Mt Hood National Forest, Oregon
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Container (plug)
Stock Type	107 ml (6.5 in ³) container
Time to Grow	10 weeks
Target Specifications	The stock type is a container seedling with a firm plug in container and well-developed crown ¹² .
Propagule Collection Instructions	Seeds are hand stripped from each plants when they reach maturity ⁴ and seed-out which can occur anywhere between June and September ⁸ .
Propagule Processing/Propagule Characteristics	Seeds are cleaned most effectively with the use of a small air screen machine ⁴ .
Pre-Planting Propagule Treatments	<p>Sow seeds indoors and directly into the containers and growing medium¹².</p> <p>The most effective growing medium used in each of the container cells is composed of 40:20:20:20 peat: composted fir bark: perlite: pumice and</p>

	<p>an addition of Nutricote controlled release fertilizer (18N:6P2O5:8K2O) which is added at the rate of 0.5 gram Nutricote per 107 ml container¹².</p> <p>Seal entire racks into plastic bags and place them into a refrigerator set at 1 to 3 °C for a total of 30 days. Throughout the duration of stratification, check cells weekly and keep moist¹².</p>
Growing Area Preparation / Annual Practices for Perennial Crops	<p>Use a greenhouse growing facility¹².</p> <p>In mid-July, remove racks from their stratification facilities, placing them immediately into greenhouses and time-release fertilizer should no longer be added to the growing medium¹².</p> <p>Lightly irrigate the containers multiple times each day, ensuring that the seeds are consistently and damp/moist throughout the duration of the germination period¹².</p>
Establishment Phase Details	<p>With consistent moisture kept in the planting medium, germination will occur uniformly across seedlings and will be complete after 1 to 2 weeks¹².</p> <p>For 1 week after germination, fertilize the plants with soluble 12-2-14-6Ca-3Mg at 100 ppm¹².</p>
Length of Establishment Phase	2 weeks
Active Growth Phase	During the active growth phase, the seedlings will grow at a rapid rate, especially with the weekly application of soluble fertilizer 20-9-20 NPK at 150 ppm for 8 weeks ¹² .
Length of Active Growth Phase	8 weeks
Hardening Phase	Plants do not require dry-down to induce dormancy. In mid-September, move the seedlings to an outdoor growing area ¹² .
Length of Hardening Phase	2 weeks
Harvesting, Storage and Shipping	<p>Harvest the plants in Mid-October¹².</p> <p>Prior to shipping, ensure that the plants are well irrigated and shipped in their containers¹².</p>
Length of Storage	Storage is not feasible except in outdoor growing areas where plants receive full irrigation treatment ¹² .
Guidelines for Outplanting / Performance on Typical Sites	Outplant the seedlings in fall for best rates of success ¹² .
Other Comments	Plants can be divided and used for vegetative propagation for outplanting if needed for site ⁹ .
INFORMATION SOURCES	

References	<p>¹Name Search Results USDA PLANTS, plants.sc.egov.usda.gov/java/nameSearch.</p> <p>²Plants Profile for Carex Arcta (Northern Cluster Sedge), plants.sc.egov.usda.gov/core/profile?symbol=CAAR2.</p> <p>³Carex Arcta Calflora, www.calflora.org/cgi-bin/species_query.cgi?where-calrecnum=1516.</p> <p>⁴Bartow, Amy. "Native Plant Network." Reforestation, Nurseries and Genetics Resources, USDA NRCS - Corvallis Plant Materials Center, npn.rngr.net/renderNPNProtocolDetails?selectedProtocolIds=cyperaceae-carex-3472.</p> <p>⁵"Carex Arcta Boott Northern Clustered Sedge (Northern Cluster Sedge) Cyperaceae (Sedge Family)." E-FLORA BC: ELECTRONIC ATLAS OF THE FLORA OF BRITISH COLUMBIA, linnet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Carex arcta.</p> <p>⁶"Carex Arcta Boott, Ill. Carex. 155, Plate 497. 1867." Carex Arcta in Flora of North America @ Efloras.org, www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=242357048.</p> <p>⁷"Carex Arcta NORTHERN CLUSTERED SEDGE." Jepson EFlora: Taxon Page Vascular Plants of California , The Jepson Herbarium, ucjeps.berkeley.edu/eflora/eflora_display.php?tid=17263.</p> <p>⁸"CNPS Inventory Plant Detail." California Native Plant Society, www.rareplants.cnps.org/detail/1849.html.</p> <p>⁹Druse, Kenneth. Making More Plants: the Science, Art, and Joy of Propagation. Stewart Tabori & Chang, 2012.</p> <p>¹⁰Franklin, Jerry F., and C. T. Dyrness. Natural Vegetation of Oregon and Washington. Pacific Northwest Forest and Range Experiment Station, Forest Service, U.S. Dept. of Agriculture, 1973.</p> <p>¹¹Kruckeberg, Arthur R. Gardening with Native Plants of the Pacific Northwest: an Illustrated Guide. Douglas & McIntyre, 1996.</p> <p>¹²Riley, Lee. "Native Plant Network Propagation Protocol Database." Reforestation, Nurseries and Genetics Resources, USDA FS - Dorena Genetic Resource Center, npn.rngr.net/renderNPNProtocolDetails?selectedProtocolIds=cyperaceae-carex-7.</p>
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<p>Other Sources Consulted</p>	<p>Clarke, Graham, and Alan R. Toogood. The Complete Book of Plant Propagation. Cassell Illustrated, 2004.</p> <p>Hartman, Hudson T. Plant Propagation: Principles and Practices. Prentice Hall India, 2002.</p> <p>Hill, Lewis. Secrets of Plant Propagation ; Starting Your Own Flowers, Vegetables, Fruits, Berries, Shrubs, Trees, and Houseplants. Way, 1985.</p> <p>Hutchinson, William A. Plant Propagation and Cultivation. AVI Publishing Company, 1980.</p> <p>Macdonald, A. Bruce. Practical Woody Plant Propagation for Nursery Growers. Timber Press, 2006.</p> <p>MAHLSTEDDE, John Peter, and Ernest Straign. HABER. Plant Propagation. John Wiley & Sons, 1957.</p>
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<p>Date Protocol Created or Updated</p>	<p>05/29/2019</p>