

Plant Propagation Protocol for *Cicuta maculata*

ESRM 412 – Native Plant Production

URL: <https://courses.washington.edu/esrm412/protocols/2024/CIMA2.pdf>



Geographic spread of *Cicuta maculata* shown in green. Image courtesy of USDA PLANTS database. [1]

TAXONOMY	
Plant Family	
Scientific Name	Apiaceae [1]
Common Name	Carrot family [1]
Species Scientific Name	
Scientific Name	<i>Cicuta maculata</i> L.
Varieties	No identified varieties identified by the USDA PLANTS database.
Sub-species	<i>Cicuta maculata</i> L. var. <i>maculata</i> [3] <i>Cicuta maculata</i> L. var. <i>angustifolia</i> Hook. [1] <i>Cicuta maculata</i> L. var. <i>bolanderi</i> (S. Watson) G. Mulligan [1] <i>Cicuta maculata</i> L. var. <i>victorinii</i> (Fernald) B. Boivin [1]

	<i>Cicuta maculata</i> L. var. <i>curtissii</i> (Coult. & Rose) Fern [3] <i>Cicuta maculata</i> L. var. <i>californica</i> (Gray) Boivin [10]
Cultivar	No cultivars found.
Common Synonym(s)	<i>Cicuta douglasii</i> (DC.) Coult & Rose [10]
Common Name(s)	Spotted water hemlock, water hemlock, common water hemlock, poison parsnip, spotted cowbane, spotted parsley, beaver poison, suicide root [1][2][4][6]
Species Code (as per USDA Plants database)	CIMA2
GENERAL INFORMATION	
Geographical range	Found in all of the United States excepting Hawaii, and in most of the Canadian provinces and territories, excepting Nunavut and Newfoundland. [1]
Ecological distribution	Generally found in moist environments such as riparian areas or wetlands, as well as open woodlands, swamps, marshes, wet prairies, or manmade ditches along roads. [5]
Climate and elevation range	Found across a range of climates including temperate and extreme temperatures as well as a range of precipitation levels found across North America. [1]
Local habitat and abundance	Generally found in grasslands with moist, well drained soils with alluvial fine-to-mixed substrate. Not commonly found in lower basins due to higher prominence of clay in the soils, suggesting need for drainage. Commonly found with other tall grasses such as <i>Sporobolus michauxianus</i> or <i>Schoenoplectus pungens</i> in middle or upper intertidal zones. Also commonly found near <i>Iris virginica shrevei</i> . Generally found in areas of high species diversity. [5][7]
Plant strategy type / successional stage	As a perennial, is tolerant to high levels of moisture via shallow roots to enable gas exchange and experiences high levels of species overturn in community due to proximity to annual grasses, enabling a competitive advantage over newly-germinating grasses in early spring. [7]
Plant characteristics	Perennial herb reaching approximately 1' in the first year before maturing in the second to up to 8'. Stems are hollow with crossed vasculature in the nodes, and purple-to-green in color. Roots are short and tuber-like. Leaves are alternately attached, clasped at the stem, and trifoliately compound with serrate margins. Flowers are small, white and umbel-like in inflorescence blooming throughout spring to fall and are pollinated by bees, wasps, and butterflies. Flowers have 5 petals, sepals, and stamens. Fruits are dry capsules, non-dehiscent, reaching a diameter of 2 to 4 mm. [3][6][8]



Cicuta maculata L. inflorescence. Image courtesy of North Carolina State University Extension. [8]

PROPAGATION DETAILS: FROM SEED

Adapted from Prairie Moon Nursery

Ecotype	Non-specified. Manufacturer located in Midwest region of the United States, which may indicate that seeds are sourced from moist grasslands in that region. [9]
Propagation Goal	Plants. [9]
Propagation Method	Seed (although instructions/generic protocols are given by the same nursery for bare-root and potted propagules.) [9]
Product Type	Containers (plugs.) [9]
Stock Type	Non-specified.
Time to Grow	1 year. [7]
Target Specifications	Initial growth stage is a low-lying rosette, before shooting upwards in second year of growth with tall stalk. This suggests that basal leaves should be well-developed (6-8 inches or longer) prior to outplanting to ensure survival. [11]
Propagule Collection Instructions	Non-specified.
Propagule Processing/Propagule Characteristics	Seeds should be kept in cold stratification or other storage for no longer than 2 years. [7]
Pre-Planting Propagule Treatments	Seeds are to be kept in media mix of equal proportions of moistened vermiculite, sand, and loam and in a sealed container in 33-38 degrees Fahrenheit, checked weekly for fungal establishment for approximately 120 days. [9]
Growing Area Preparation / Annual	Media should be low in clay content and high in loam and sand, but specific ratios are not given. As <i>Cicuta maculata</i> 's roots are not deep and instead form short tubers, shallow trays should be sufficient for germination. [9]

Practices for Perennial Crops	
Establishment Phase Details	Non-specified, but given wetland adaptation of the plants, soil should likely be kept moist but not wet.
Length of Establishment Phase	1-4 weeks. [12]
Active Growth Phase	Non-specified.
Length of Active Growth Phase	Approximately 2 years – first to develop roots, second to bolt into taller stalk. [8]
Hardening Phase	Non-specified.
Length of Hardening Phase	Non-specified.
Harvesting, Storage and Shipping	Non-specified.
Length of Storage	Can be stored for up to 1 year once germinated. [9]
Guidelines for Outplanting / Performance on Typical Sites	Non-specified.
Other Comments	No published protocols were found on Native Plant Network’s database for any species within the genus <i>Cicuta</i> . Hence, nursery-prescribed production instructions appeared to be the most detailed in lieu of professional, species-specific protocols.
INFORMATION SOURCES	
References	See below.
Other Sources Consulted (USDA, Agricultural Research Service, National Plant Germplasm System. 2024. Germplasm Resources Information Network (GRIN Taxonomy). National Germplasm Resources Laboratory, Beltsville, Maryland. https://npgsweb.arsgrin.gov/gringlobal/taxon/taxonomydetail?id=10545 . Accessed 22 May 2024.
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[1] United States Department of Agriculture Natural Resources Conservation Service. “*Cicuta Maculata* L.” *USDA PLANTS Database*, plants.sc.egov.usda.gov/home/plantProfile?symbol=CIMA2. Accessed 22 May 2024.

[2] U.S. Fish & Wildlife Service. “*Cicuta Maculata*.” *U.S. Fish & Wildlife Service*, www.fws.gov/species/water-hemlock-cicuta-maculata. Accessed 22 May 2024.

[3] Native Plant Trust. “*Cicuta Maculata* (Spotted Water-hemlock).” *Native Plant Trust*, gobotany.nativeplanttrust.org/species/cicuta/maculata. Accessed 22 May 2024.

- [4] TWC Staff. "Cicuta Maculata." *Lady Bird Johnson Wildflower Center - the University of Texas at Austin*, 1 July 2021, www.wildflower.org/plants/result.php?id_plant=cima2.
- [5] Illinois Wildflower Association. "Water Hemlock (Cicuta Maculata)." *Wetland Wildflowers of Illinois*, www.illinoiswildflowers.info/wetland/plants/water_hemlock.htm#:~:text=This%20plant%20spreads%20by%20reseeding,tolerated%2C%20if%20it%20is%20temporary. Accessed 22 May 2024.
- [6] Florida Wildflower Foundation. "Spotted Water Hemlock." *Florida Wildflower Foundation*, 22 July 2016, www.flawildflowers.org/flower-friday-cicuta-maculata.
- [7] Committee on the Status of Endangered Wildlife in Canada. "COSEWIC Assessment and Status Report on the Victorin's Water-hemlock *Cicuta Maculata* Var. *Victorinii* in Canada." *Species at Risk Public Registry*, 17 Nov. 2022, species-registry.canada.ca/index-en.html#/documents/426.
- [8] North Carolina State University. "Cicuta Maculata (Beaver Poison, Cowbane, Poison Hemlock, Poison Parsnip, Spotted Cowbane, Spotted Hemlock, Spotted Water Hemlock, Water Hemlock) | North Carolina Extension Gardener Plant Toolbox." *North Carolina Extension Gardener Plant Toolbox*, plants.ces.ncsu.edu/plants/cicuta-maculata. Accessed 22 May 2024.
- [9] Prairie Moon Nursery. "Cicuta Maculata." *Prairie Moon Nursery*, www.prairiemoon.com/cicuta-maculata-water-hemlock#panel-planting. Accessed 22 May 2024.
- [10] Utah State University. "Water Hemlock." *Range Plants of Utah*, extension.usu.edu/rangeplants/forbs-herbaceous/water-hemlock. Accessed 22 May 2024.
- [11] University of Florida. "Cicuta Maculata." *Center for Aquatic and Invasive Plants*, plants.ifas.ufl.edu/plant-directory/cicuta-maculata. Accessed 22 May 2024.
- [12] "Cicuta Maculata 50 Seeds - Water Hemlock." *The Garden of Set Nursery*, thegardenofset.com/products/cicuta-maculata-50-seeds-water-hemlock?variant=42869343584513. Accessed 22 May 2024.