

**Plant Propagation Protocol for *Callirhoe involucrata***



ESRM 412 – Native Plant Production


URL: <https://courses.washington.edu/esrm412/protocols/2022/CAIN2.pdf>



(NC State)

TAXONOMY	
Plant Family	
Scientific Name	Malvaceae
Common Name	Mallows
Species Scientific Name	
Scientific Name	Genus: <i>Callirhoe</i> Species: <i>involucrata</i> Species Authorities: John Torrey, Asa Gray
Varieties	<i>Callirhoe involucrata</i> var. <i>bushii</i> (Fernald) R.F. Martin <i>Callirhoe involucrata</i> var. <i>novomexicana</i> Baker f.
Sub-species	None
Cultivar	None
Common Synonym(s)	None
Common Name(s)	Poppy mallow, purple poppy mallow, finger poppy mallow, wine cups
Species Code (as per USDA Plants database)	CAIN2 (USDA)
GENERAL INFORMATION	

Geographical range	 <p>(USDA)</p>  <p>(USDA)</p>
Ecological distribution	Plant commonly occurs in dry rocky areas, like prairies, pastures, open woods, and roadsides (Mahr).
Climate and elevation range	Preferred climate is hot, dry, sunny areas (Mahr). Plant can survive in USDA hardiness zones 4-8 (NC State). Elevation range unknown.
Local habitat and abundance	<p>Plant is found across the US in many states. It is concentrated in the central regions of the country, but is also found in some parts of Oregon. It can also be found in Mexico (Mahr).</p> <p>Plant does best in well drained soil that is evenly moist to occasionally dry. It can tolerate clay, loam, sand, and shallow rocky soil types (NC State).</p> <p>Plant is commonly associated with the Gray Hairstreak butterfly (<i>Strymon melinus</i>), serving as a larval host and nectar source (NC State).</p>

<p>Plant strategy type / successional stage</p>	<p>Plant is a drought tolerant wildflower (Mahr). It is also tolerant of poor soils (Klingaman). When in bloom, its upward facing, cup shaped flowers remain open during the day and close at night. Flowers close up once pollinated (Mahr). Flowers are vibrant magenta, which helps attract pollinators. They first appear in the spring and last through summer (NC State). Plants die back to the crown in winter but reemerge in the spring, forming trailing, 15 cm tall mounds of foliage by mid-spring. Leaves can serve as ground cover (Klingaman).</p>
<p>Plant characteristics</p>	<p>Plant is a herbaceous perennial (NC State). It is classified as a herb/forb (USDA). Aboveground growth usually only reaches about 15 cm (Mahr). Belowground, plant has a perennial taproot that can grow up to 5-7.5 cm wide and up to 2 m deep (Klingaman). Plant stems are green and covered with fine, spreading white hairs. Leaves are typically 10 x 10 cm and palmately divided into 5-7 lobes. They are generally orbicular in outline and coarsely toothed (NC State). Flowers are cup shaped and mostly magenta with a white spot at the base of all 5 petals. Flowers and are typically 4-6 cm in diameter.</p>  <p>Cup shaped flowers in bloom (National Gardening Association).</p>



Close-up view of flower, stem, and leaves (National Gardening Association).



Close-up view of a leaf (National Gardening Association).

### PROPAGATION DETAILS

PlantSelect.org

Colorado State University and Denver Botanical Gardens  
(Plant Select)

Ecotype	Colorado
Propagation Goal	Plants
Propagation Method	Seed and vegetative (cuttings)
Product Type	Seeds
Stock Type	No information provided.
Time to Grow	No information provided.
Target Specifications	No information provided.
Propagule Collection Instructions	Summer through fall, hand pick seeds all season long. At the end of the season, cut stems and dry them in

	open large trash bags. Clean seeds from stems when dry.
Propagule Processing/Propagule Characteristics	Break wheels (fruit) into individual seeds with a rolling pin if necessary
Pre-Planting Propagule Treatments	<p>Pretreatment of seeds is necessary. Scarify seeds with Acid, ZeroTol or a hot water bath. One experiment used ZeroTol and a hot water bath combination. Place clean seeds in a thermos coffee mug and add ZeroTol to cover seeds let sit for 20-30 min. Add hot water to ZeroTol seed mix and let sit for 1 hour, then rinse clean. Add Sodium Bicarbonate to seeds, stir, then let sit 20 min. Rinse seeds again, then add near boiling water (82°C or 180°F) over seeds with a few drops of Dawn dish-washing liquid to the thermos cover and let sit overnight. Seeds are now ready to plant.</p> <p>Alternatively, seed germinates better after hot water scarification. Place desired amount of seed in a mason jar. Fill remainder of jar with water that is hotter than 71°C (160°F), but not quite boiling. Seal jar, and bury in perlite to allow seed to cool down slowly. Remove seed from jar on the following day and rinse over a screen. Seeds are now ready to plant.</p> <p>After germination and after young plants have been transplanted, you can obtain a new flush of plants from other dormant seeds by placing the used tray in the cooler for 1 month at 5°C (41°F).</p> <p>Dip cuttings of young shoots in rooting hormone, then mist for 2-3 days. Two-node cuttings will root with 1:10 Dip'n Grow, but losses are sometimes unacceptably high.</p>
Growing Area Preparation / Annual Practices for Perennial Crops	<p>Post ZeroTol and hot water bath combination scarification: plant in trays and lightly cover seeds with per-lite.</p> <p>Post hot water scarification: sow seed in an open 1020 flat and cover it. Place tray under mist until seed germinates.</p> <p>Greenhouse conditions: no special care needed, very forgiving once started. Slugs can be a problem on small plants.</p> <p>Garden conditions: Self sufficient plant, minimal care needed, drought tolerant, doesn't like wet feet (excess root moisture).</p>
Establishment Phase Details	No information provided.
Length of Establishment Phase	No information provided.
Active Growth Phase	No information provided.



Length of Active Growth Phase	No information provided.
Hardening Phase	No information provided.
Length of Hardening Phase	No information provided.
Harvesting, Storage and Shipping	Harvesting: when sufficient quantities of seeds have germinated, prick out seedlings with a dibble. Do not disturb the soil excessively while pricking out seedlings. Then, return the tray to the bench, and wait for more seedlings to germinate because seed does not germinate uniformly. Instead, it germinates over a period of time. Continue to prick out seedlings until it becomes apparent that no more seed will germinate.
Length of Storage	No information provided.
Guidelines for Outplanting / Performance on Typical Sites	No information provided.
Other Comments	Plant will go dormant in drought situations with regrowth occurring when moisture returns. Plant is a favorite of rabbits and other foragers. ZeroTol: Hydrogen Dioxide is made by BioSafe Systems. Product will burn your skin. You can use Hydrogen Peroxide, but will need to soak seeds for 6 hrs or more.
<p style="text-align: center;"><b>PROPAGATION DETAILS</b>  Native Plant Journal  Rocky Mountain Native Plants Company  (Alberts and Mandel)</p>	
Ecotype	Colorado
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Container (plug)
Stock Type	No information provided.
Time to Grow	No information provided.
Target Specifications	No information provided.
Propagule Collection Instructions	No information provided.
Propagule Processing/Propagule Characteristics	Average seed weight is 160,200 seeds/kg (72,800 seeds/lb), although this can vary by population
Pre-Planting Propagule Treatments	Seeds have physical dormancy and should be scarified prior to planting. At RMNP uses a hot water scarification treatment. Using wet heat is an effective method for many small-seeded species with hard impermeable seed coats as it provides a rapid, uniform treatment, and results of the treatment can easily be seen within a few hours. Thickness of the seed coat may vary somewhat among sources, so it is a good idea to dissect a few seeds and examine the thickness of seed coats from each lot to help determine duration of

	the wet-heat treatment. Seeds are added to boiling water for only 5-10 sec and then immediately transferred to a vat of cold water, which allows them to quickly cool and prevents embryo damage. The seeds imbibe in the cool water 1 day and are ready for sowing without further treatment.
Growing Area Preparation / Annual Practices for Perennial Crops	Individual Ray Leach 164 mL (10 in <sup>3</sup> ) containers and lightly cover seeds with mulch approximately 1.5 mm deep. RMNP uses Scott's Metro Mix 360 (the Scott's Company, Marysville, Ohio) growing medium..
Establishment Phase Details	Fertigate with Peters Professional fertilizer 20:10:20 (20N:10P <sub>2</sub> O <sub>5</sub> :20 K <sub>2</sub> O) at the rate of 50 ppm twice weekly until seedlings develop a firm root plug. No heavy fertilizer application is used because it would produce seedlings unable to adapt after outplanting.
Length of Establishment Phase	Seedlings emerge within a few days after sowing and grow rapidly
Active Growth Phase	Plant produces a fleshy taproot, which eventually becomes somewhat woody, so it's important to avoid over watering during production
Length of Active Growth Phase	Plant typically produces a firm root plug in as little as 1 month
Hardening Phase	No information provided.
Length of Hardening Phase	No information provided.
Harvesting, Storage and Shipping	Harvesting: extra care is needed when extracting seedlings of containers for outplanting to ensure that the root is not damaged and to avoid transplant shock
Length of Storage	No information provided.
Guidelines for Outplanting / Performance on Typical Sites	No information provided.
Other Comments	Once well established after outplanting, this species is a hardy, drought tolerant perennial that thrives in full, hot sun exposures, and sandy to gravelly soils. It also grows well in loamy garden soils if the soil is allowed to dry well between irrigations or if drainage is provided. Its wide native range, hardiness, and drought-tolerant character make it an excellent choice for xeriscapes and native roadside plantings.
<b>INFORMATION SOURCES</b>	
References	efloras.org. "Callirhoe Involucrata." <i>Flora of North America</i> , <a href="http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=242416215">http://www.efloras.org/florataxon.aspx?flora_id=1&amp;taxon_id=242416215</a> .  Texas Tech University. "Winecup, Poppy Mallow." <i>TTU Plant Resources</i> ,

	<p><a href="https://www.depts.ttu.edu/plantresources/Pages/Landscape_Information_Sheets/Herbaceous_Info/Callirhoe_involucrata.php">https://www.depts.ttu.edu/plantresources/Pages/Landscape_Information_Sheets/Herbaceous_Info/Callirhoe_involucrata.php</a>.</p>
Other Sources Consulted	<p>Alberts, Dan, and Randy Mandel. "Propagation Protocol for Callirhoe Involucrata." <i>Native Plants Journal</i>, vol. 5, no. 1, 2004, pp. 25–26., <a href="https://doi.org/10.2979/npj.2004.5.1.25">https://doi.org/10.2979/npj.2004.5.1.25</a>.</p> <p>IPNI. "Gray, Asa (1810-1888)." <i>International Plant Names Index</i>, <a href="https://www.ipni.org/a/19574-1">https://www.ipni.org/a/19574-1</a>.</p> <p>IPNI. "Torrey, John (1796-1873)." <i>International Plant Names Index</i>, <a href="https://www.ipni.org/a/10754-1">https://www.ipni.org/a/10754-1</a>.</p> <p>Klingaman, Gerald. "Plant of the Week: Poppy Mallow ." <i>University of Arkansas Division of Agriculture</i>, 25 July 2008, <a href="https://www.uaex.uada.edu/yard-garden/resource-library/plant-week/poppy-mallow-7-25-08.aspx">https://www.uaex.uada.edu/yard-garden/resource-library/plant-week/poppy-mallow-7-25-08.aspx</a>.</p> <p>Mahr, Susan. "Winecups, Callirhoe Involucrata." <i>Wisconsin Horticulture</i>, University of Wisconsin - Madison, <a href="https://hort.extension.wisc.edu/articles/winecups-callirhoe-involucrata/">https://hort.extension.wisc.edu/articles/winecups-callirhoe-involucrata/</a>.</p> <p>The Morton Arboretum. "Callirhoe Involucrata." <i>SEINet</i>, Arizona State University, <a href="https://swbiodiversity.org/seinet/taxa/index.php?taxon=3735&amp;clid=3518">https://swbiodiversity.org/seinet/taxa/index.php?taxon=3735&amp;clid=3518</a>.</p> <p>National Gardening Association. "Winecup (Callirhoe Involucrata)." <i>Plants Database</i>, <a href="https://garden.org/plants/view/75667/Winecup-Callirhoe-involucrata/">https://garden.org/plants/view/75667/Winecup-Callirhoe-involucrata/</a>.</p> <p>NC State. "Callirhoe Involucrata." <i>Extension Gardener: North Carolina Plant Toolbox</i>, North Carolina State University, <a href="https://plants.ces.ncsu.edu/plants/callirhoe-involucrata/">https://plants.ces.ncsu.edu/plants/callirhoe-involucrata/</a>.</p> <p>Plant Select. "Callirhoe Involucrata Propagation Protocol." <i>Plant Select</i>, Denver Botanic Gardens, Colorado State University, <a href="https://plantselect.org/">https://plantselect.org/</a>.</p>



	USDA. "Callirhoe Involucrata (Torr. & A. Gray) A. Gray." <i>USDA Plants Database</i> , <a href="https://plants.usda.gov/home/plantProfile?symbol=CAIN2">https://plants.usda.gov/home/plantProfile?symbol=CAIN2</a> .
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