

ESRM PLANT PROTOCOL

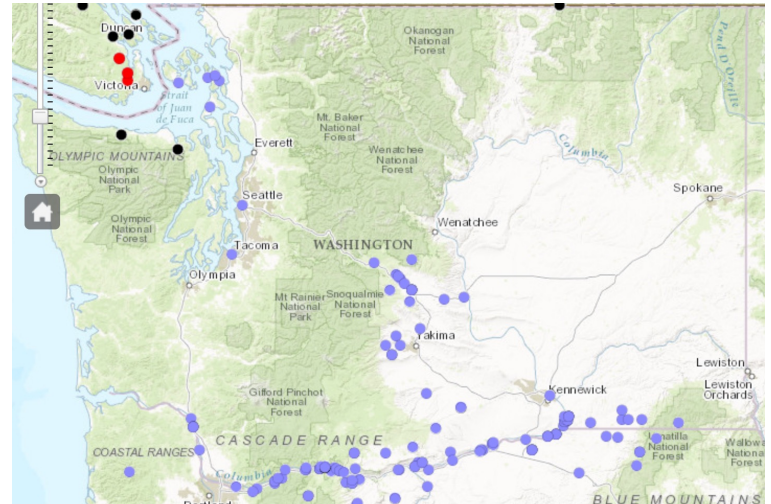
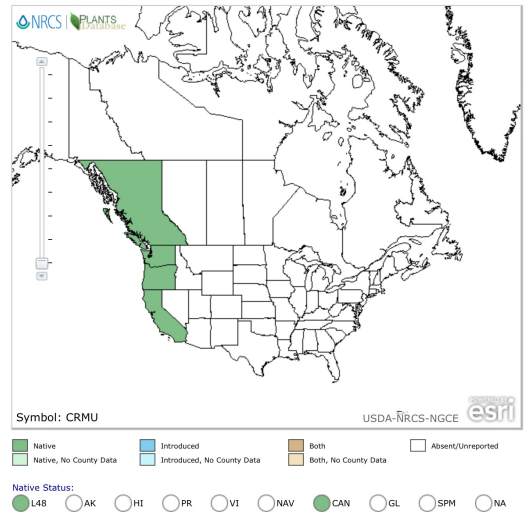
Plant Propagation Protocol for *Crocidium Multicaule*

ESRM 412 – Native Plant Production

Protocol URL: <https://courses.washington.edu/esrm412/protocols/CRMU.pdf>

North American Distribution

Washington State Distribution



North American Map from USDA-NRCS Plants Database.

Washington State Map from E-Flora B.C.⁴

TAXONOMY	
Plant Family	
Scientific Name	<i>Asteraceae</i>
Common Name	Aster Family
Species Scientific Name	
Scientific Name	<i>Crocidium Multicaule</i> Hook. ³
Varieties	N/A at this time
Sub-species	N/A at this time
Cultivar	N/A at this time
Common Synonym(s)	None ⁸
Common Name(s)	Common spring gold, ⁴ spring gold, gold star ³
Species Code (as per USDA Plants database)	CRMU ⁷
GENERAL INFORMATION	
Geographical range	Canada, Oregon, California, Washington
Ecological distribution	Found in dry, sun exposed areas. Tend to be in shrub-steppe regions. ⁸

Climate and elevation range	Dry, low elevation ⁵
Local habitat and abundance	Found on either side of the Cascade crest. ⁸ Species not in danger, abundant. ⁸
Plant strategy type / successional stage	For wetter areas the successional status is early seral, while on drier areas with more sunlight the successional stage is climax. ⁵
Plant characteristic	<p>General: This is a vascular plant, a dicot annual forb or herb ² grows between 5-30 cm tall.</p> <p>Leaves: Have hair between leaves and trunk of plant but otherwise is hairless. The leaves towards the base of the plant are round while leaves on the stem tend to be thinner and switch off.⁵</p> <p>Flower: 8 to 13 flowers anywhere between 4-10 mm in length.</p>
PROPAGATION DETAILS	
Garry oak Ecosystems Native Plant Propagation Guidelines	
Note: Information from other sources included as well	
Ecotype	Dry areas with plentiful sun exposure like cliff ledges, and open rocky areas. ⁵
Propagation Goal	Plants
Propagation Method	Seed propagation ⁵
Product Type	N/A at this time.
Stock Type	N/A at this time.
Time to Grow	N/A at this time.
Target Specification	<p>Plant:</p> <p>Height: 1.5 dm.</p> <p>Leaves:</p> <p>Height: 2.5 cm.</p> <p>Length: 1 cm.⁸</p>
Propagule Collection Instructions	Manually collect the matured flower heads by hand and dry them in paper bags. ⁵
Propagule Processing/Propagule Characteristics	To extract seeds use rubbing motions on the flower head. Separate the seeds from chaff with air pressure and using a screen. ⁵
Pre-Planting Propagule Treatments	Whether this plant needs a dormancy treatment is unavailable at this time, but planting in the fall is recommended for now. ⁵
Growing Area Preparation / Annual	Propagate seeds outdoors for approximately 20 days and thin out plant until it is around 3 inches. ¹ Annual plant, need to be out in the sunlight, cannot be under shade. ⁵
Practices for perennial crops	N/A at this time

Establishment Phase Details	N/A at this time
Length of Establishment Phase	N/A at this time
Active Growth Phase	June-July (fruit ripens) ⁵
Length of Active Growth Phase	Growing a lot in younger years (opposite of exponential rate)
Hardening Phase	N/A at this time
Length of Hardening Phase	N/A at this time
Harvesting, Storage and Shipping	Harvest between July-August ⁵
Length of Storage	N/A at this time
Guidelines for Outplanting/ Performance on Typical Sites	Will flower between March to May ⁸
Other Comments	Could potentially use plant as a “reclamation species” in rehab sites where there is low moisture and open sunlight. ⁵

PROPAGATION DETAILS

Shrub-Steppe Species Germination Trials and Survival after Outplanting on Bare Soils

Note: species failed to grow⁶

Ecotype	Moderately barren shrub-steppe ecosystem. ⁶
Propagation Goal	Plants
Propagation Method	Seed propagation
Product Type	Germination in Petri dishes, planned to move to tubes but did not because they did not germinate. ⁶
Stock Type	Not included in study.
Time to Grow	Failed to germinate. ⁶
Target Specification	Not included in study.
Propagule Collection Instructions	Not included in study. Attempted to propagate 30 seeds, and were planted directly after collecting seeds. ⁶
Propagule Processing/ Propagule Characteristics	Not included in study.

Pre-Planting Propagule Treatments	Not included in study
Growing Area Preparation/ Annual Practices for Perennial Crops	Paper towel and filter paper were placed inside of Petri dishes and the seeds were put between them. Seed were kept moist using 3 ml of distilled water. The dishes were covered and held at 20 degrees Celsius without light for 72 hours. Then they were given sunlight for about 10 hours daily, held at 20 degrees Celsius. ⁶
Establishment Phase Details	Not included in study
Length of Establishment Phase	Not included in study
Active Growth Phase	Not included in study
Length of Active Growth Phase	Not included in study
Hardening Phase	Not included in study
Length of Hardening Phase	Not included in study
Harvesting, Storage and Shipping	Not included in study
Length of Storage	Not included in study
Guidelines for Outplanting/ Performance on Typical Sites	Not included in study
Other Comments	This specific protocol is based upon what the Forest Service released on germination trials done on <i>Crocidium Multicaule</i> . All 100% of <i>Crocidium Multicaule</i> propagated failed to germinate. The unsuccessful germination was thought to be due to the seeds being unviable or needing its dormancy interrupted. ⁶
INFORMATION SOURCES	
References	<ol style="list-style-type: none"> 1. "Annual/Biennial Seed Germination Database." <i>Annual/Biennial Seed Germination Database</i>. N.p., n.d. Web. 25 May 2016. 2. "Calflora: Crocidium Multicaule." <i>Calflora: Crocidium Multicaule</i>. N.p., n.d. Web. 25 May 2016. 3. "Crocidium Multicaule." <i>Crocidium Multicaule</i>. N.p., n.d. Web. 23 May 2016. 4. "E-Flora BC : Interactive Map." <i>E-Flora BC : Interactive Map</i>. N.p., n.d. Web. 23 May 2016. 5. "GOERT: Garry Oak Ecosystems Recovery Team." <i>GOERT : For Gardeners & Restoration Practitioners</i> :

	<p><i>Propagation Guidelines</i>. N.p., n.d. Web. 25 May 2016.</p> <p>6. Link, Steven O., Rico O. Cruz, Barbara L. Harper, Janice D. Jones, and Beverly L. Penney. "Shrub-Steppe Species Germination Trials and Survival after Outplanting on Bare Soils." <i>Forest Service</i> (n.d.): n. pag. Web. 24 May 2016.</p> <p>7. "Plants Profile for Crocidium Multicaule (common Spring-gold)." <i>Plants Profile for Crocidium Multicaule (common Spring-gold)</i>. N.p., n.d. Web. 25 May 2016.</p> <p>8. "WTU Herbarium Image Collection - Burke Museum." <i>WTU Herbarium Image Collection - Burke Museum</i>. N.p., n.d. Web. 24 May 2016.</p>
Other Sources Consulted	<p>9. Carter, Susan. <i>Beatty Creek Research Natural Area</i>. Rep. Vol. 11. N.p.: n.p., 2004. Print. Kalmiopsis.</p> <p>10. John, Harold St. <i>Revision of the Genus Crocidium</i>. Rep. Vol. 28. N.p.: Torreya, n.d. Print.</p> <p>11. Link, Steven O., Richard E. Welch, Randy M. Hermann, and Terry E. Northstrom. <i>Vegetative Characteristics of the Shepherds Flat Wind Farm</i>. Rep. N.p.: LifeLine Renewable Energy, n.d. Print.</p> <p>12. Ornduff, Robert, N. A. M. Saleh, and B. A. Bohm. "The Flavonoids and Affinities of Blennosperma and Crocidium (Compositae)." <i>Taxon</i> 22.4 (1973): 407. Web.</p> <p>13. Sharsmith, Helen K. "Flora of the Mount Hamilton Range of California (A Taxonomic Study and Floristic Analysis of the Vascular Plants)." <i>American Midland Naturalist</i> 34.2 (1945): 289. Web. 25 May 2016.</p> <p>Note: Interviewed two nurseries, Fourth Corners and Oxbow Nursery, neither knew about this species.</p>
Protocol Author	Monica Kim
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