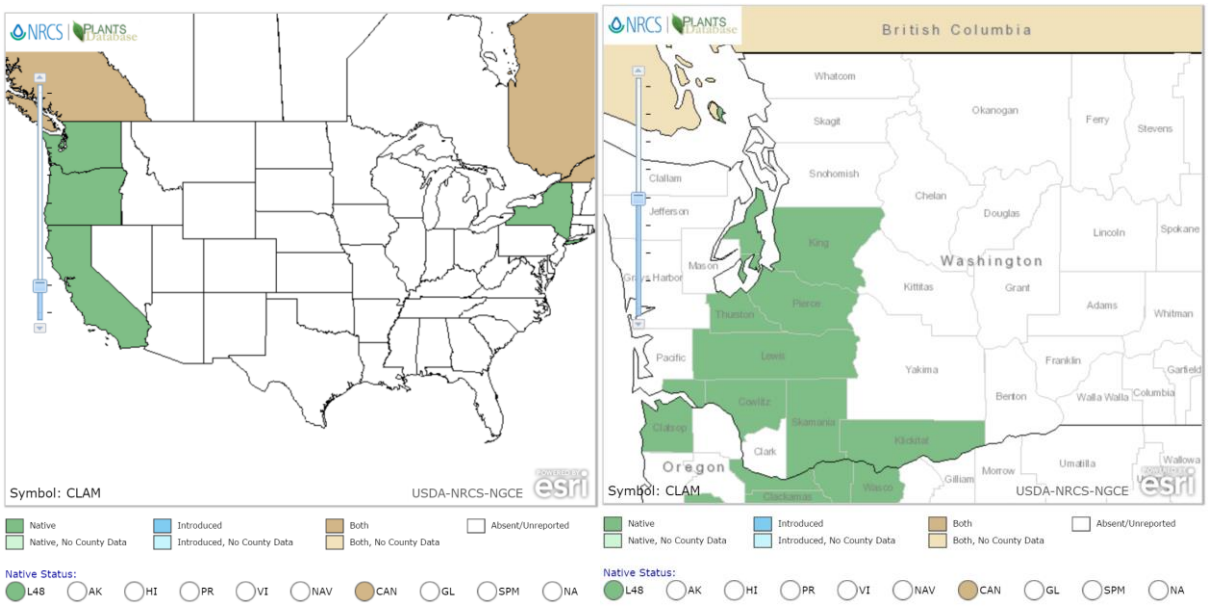
Plant Propagation Protocol for *Clarkia amoena*
ESRM 412 – Native Plant Production
Spring, 2016
Protocol URL: https://courses.washington.edu/esrm412/protocols/*CLAM.pdf*
Source: USDA PLANTS Database, 2016



TAXONOMY	
Plant Family	
Scientific Name	Onagraceae
Common Name	Primrose / Willowherb Family
Species Scientific Name	
Scientific Name	*Clarkia amoena* (Lehm.) A. Nelson & J.F. Macbr.
Varieties	
Sub-species	*Clarkia amoena* ssp. *huntiana* *Clarkia amoena* ssp. *lindleyi* *Clarkia amoena* ssp. *caurina* *Clarkia amoena* ssp. *whitneyi*
Cultivar	At least a dozen various cultivars with more pronounced petals, larger leaves, and deeper colors.
Common Synonym(s)	
Common Name(s)	Farewell-to-spring
Species Code	CLAM
GENERAL INFORMATION	
Geographical range	See maps above for distribution.[1]
Ecological distribution	Coastal areas from British Columbia to California[2]
Climate and elevation range	Relatively dry, grassy, open areas and bluffs, forest edges at low elevations, scattered, locally common,

	More common through lower Washington and Oregon[3].
Local habitat and abundance	Partial shade, sandy loam, nutrient poor soils[2]
Plant strategy type / successional stage	Early spring emergence on low-nutrient soil conditions.
Plant characteristics	Tap rooted herbaceous forb; annual.
PROPAGATION DETAILS: **Russell, M. (2011). Dormancy and Germination Pre-Treatments in Willamette valley native plants. *Northwest Science, 85*(2), 389–402. doi:10.3955/046.085.0222 [7]**	
Ecotype	Serpentine soils along coastal slopes and bluffs
Propagation Goal	Plants for seed propagules
Propagation Method	Large, round seeds
Product Type	Seed propagules
Stock Type	
Time to Grow	Early spring through early summer.
Target Specifications	Plant height ranges between 10-100 cm. Generally, 30 cm heights are realized.
Propagule Collection Instructions	Propagules to be collected in fall through winter. Harvest dried heads then comb them to separate propagules from flower head stems. Seeds may be washed in a tub of water to separate seeds from debris, as well as remove seeds that are not viable and float.
Propagule Processing/Propagule Characteristics	Capsules are pod-like, 8-ribbed, 4-chambered with numerous seeds; angled, not hairy[3]. mid-summer blooming that generally ranges from June through August or later if adequately watered 816,000 to 1,100,000 seeds per pound / lb[5] Seed rate at 2 pounds per acre (15-25 seeds per ft^2) via broadcast seed drill[5] High seed abundance Medium seedling vigor
Pre-Planting Propagule Treatments	Seeds should be stored in a cool, dry environment until ready for planting. Soak seeds for 24 hours before planting to ensure ample moisture. Nutrient-rich soils inhibit the number of flower heads produced and encourage taller vegetative growth[5]
Growing Area Preparation / Annual Practices for Perennial Crops	Soil beds for seed collection are a more economically-viable option than propagation from containers. *C. amoena* are drought-tolerant and exhibit better success if not transplanted due to their taproot system. Maximum root depth: 12 inches 5.2-8.5 pH; some tolerance to saline and alkaline soil conditions.
Establishment Phase Details	Prepare a seed bed by tilling to expose soil. Sow seed at shallow depth (¼ inches) by raking after seeds are

	broadcast seeded[6]. Seeds require ample water and sunlight to break dormancy. The beds should be well-drained and slightly acidic. Sandy and clayey soils are also tolerable.
Length of Establishment Phase	30 days
Active Growth Phase	Germination typically from late fall through May for Pacific Northwest. Temperatures >50F for germination and growth. Bloom time typically within 90 days from seed emergence[2].
Length of Active Growth Phase	Seeds mature and dry within 30 days of flowering. As temperatures fall below 46F, the plant discontinues growing and dies. Most growth is determinate, in such that the plant produces one larger crop of seeds rather than a continual flowering stage. Plants grow best in full sun, but are able to grow in partial-shaded conditions.
Hardening Phase	No hardening phase; annual.
Length of Hardening Phase	N/A
Harvesting, Storage and Shipping	Propagation of seedlings for transplant may not be an economically-feasible option because the plants are short-lived annuals. Additionally, their deep taproot system increases the risk of shock if transplanted. Under most conditions, *C. amoena* readily reseeds itself. Therefore, the most economically-feasible option for this plant is the harvest of seed which may then be dispersed on restoration sites.
Length of Storage	Undetermined maximum length of storage before seeds lose viability.
Guidelines for Outplanting / Performance on Typical Sites	Plants are not recommended for outplanting. 100 cm max. height. *C. amoena* has successful re-seeding on most sites.
Other Comments	The seeds were parched and then pounded into a dry seed meal and eaten by the Sierra Miwok in the Sierra Nevada foothills of California.[4] *C. amoena* serves as an important native bee food source and therefore some site analysis may be needed to determine if any adverse effects of seed collection may occur.[5] Avoid harvesting more than 10% of the seeds from a given location to ensure a stable seed bank for a site.
INFORMATION SOURCES	
References	See below
Other Sources Consulted	See below
Protocol Author	David Hagopian
Date Protocol Created or Updated	05/22/16

References:

USDA Plants Database. Retrieved May 16, 2016, from State Search for Genus Clarkia, http://plants.usda.gov/java/stateSearch[1]

Lady Bird Johnson Wildflower center - the University of Texas at Austin. (2016). Retrieved May 21, 2016, from Clarkia amoena, http://www.wildflower.org/plants/result.php?id_plant=CLAM[2]

Pojar, J., MacKinnon, A., & Alaback, P. (2004). *Plants of the pacific northwest coast: Washington, Oregon, British Columbia & Alaska*. Pg. 209. Vancouver: Lone Pine Publishing USA[3]

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Hamman, S., Bakker, J., Smith, S., & U. S. Fish & Wildlife. (2004, August 31). *Cascadia Prairie*. Retrieved May 15, 2016, from Regional Prairie Native Seed Project, http://cascadiaprairieoak.org/wp-content/uploads/2015/12/Regional-Native-Seed-2014-Report.pdf[6]

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Rose, R., Haase, D. L., & Chachulski, C. E. C. (1998). *Propagation of pacific northwest native plants*. United States: Oregon State University Press.[8]

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