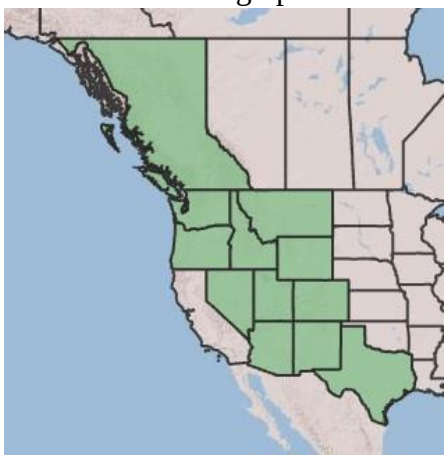
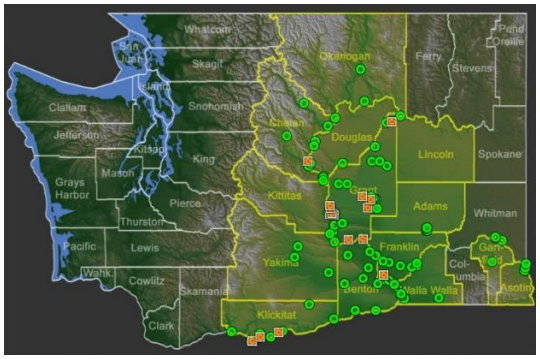
Plant Propagation Protocol for *Oenothera pallida*
ESRM 412 – Native Plant Production
URL: https://courses.washington.edu/esrm412/protocols/2024/OEPA.pdf

United States Geographic Distribution[7]



Washington State Geographic Distribution[1]



TAXONOMY	
Plant Family	
Scientific Name	Onagraceae
Common Name	Evening primrose family
Species Scientific Name	
Scientific Name	*Oenothera pallida* Lindl.
Varieties	
Sub-species	*Oenothera pallida* subsp. *gypsophila* (Eastw.) Munz & W. E. Klein *Oenothera pallida* subsp. *latifolia* (Rydb.) Munz *Oenothera pallida* subsp. *pallida* (Engelm.) *Oenothera pallida* subsp. *runcinata* (Engelm.) Munz *Oenothera pallida* subsp. *trichocalyx* (Nutt.) Munz & W. E. Klein
Cultivar	
Common Synonyms	*Anogra pallida* (Lindl.) Britton *Baumannia douglasiana* Spach *Oenothera albicaulis var. pallida* (Lindl.) H. Lév.
Common Name(s)	Pale evening primrose
Species Code (as per USDA Plants database)	OEPA
GENERAL INFORMATION	
Geographical range	British Columbia, western United States, northern Mexico.[4,12] See maps above for United States and Washington distribution ranges.

Ecological distribution	Open slopes and flats, dry, sandy/gravelly soil.
Climate and elevation range	Prefers dry, cold summer climate. Found between 1050-2450 meters.[4]
Local habitat and abundance	Sandy dunes, basins, plains.[4] Planting density per acre maximum of 4800.[4]
Plant strategy type / successional stage	1997 soil core sampling of a 1995 burn site at mountain foothills in Utah showed rare abundance of O. pallida seeds (roughly 1 in 2000) in comparison to other native perennials (rough total of 1 in 5000).[17] Suggests potential role as succesional species. Drought and fire tolerant, stress-tolerator.
Plant characteristics	Perennial forb/herb with taproot and lateral roots, glabrous to villous, erect central stem and other ascending/branching stems 10-50 cm long, white bark.[1] Subspecies vary in pubescence, leaf division, seed pod configuration, and aspect.[4] Leaves alternate, lanceolate/linear-lanceolate/ovate blade, 1-5 cm x 0.3-1 cm, entire/serrate/dentate/sinuate margins.[4] Flowers solitary, 4 sepals, 4 petals broadly obovate/obcordate, white fading to pale pink/lavender.[1, 4]
PROPAGATION DETAILS[3, 14, 15, 16]	
Ecotype	
Propagation Goal	plants
Propagation Method	seed
Product Type	Container (plug)
Stock Type	
Time to Grow	8-9 months
Target Specifications	4-6 true leaves
Propagule Collection Instructions	Seeds collected by hand when fruit capsules are dark brown and woody, usually in August. Capsules crushed by hand, hand-screened to filter out chaff. Stored under dry, cold conditions until sowing.
Propagule Processing/Propagule Characteristics	Seed density roughly 700,000 per pound.[7]

	Seed longevity between 3-5 years at room temperature. Some seeds of genus *Oenothera* viable up to 25 years when hermetically-sealed, up to 80 years when buried in moist soil.[3]
Pre-Planting Propagule Treatments	Seeds imbibed in water for 4 hours, placed on wet paper towels and sealed in bags. Seeds underwent 3-5 month cold, moist stratification at 1-3C. Link et. al. study attempted propagation of *O. pallida* without cold stratification, resulted in 0% germination.[5]
Growing Area Preparation / Annual Practices for Perennial Crops	Kept in greenhouse and outdoor nursery. Greenhouse day temperature at 21-28C (optional night temperature at 15C).[14,15] Medium contained high ratio of sand and potting soil against vermiculum and perlite, seeds sown in 160 ml container and watered thoroughly.[14,15] *O. villosa* protocol used Osmocote controlled release fertilizer (13N:13P2O5:13K2O; 8 to 9 month release rate at 21C) and Micromax fertilizer (12%S, 0.1%B, 0.5%Cu, 12%Fe, 2.5%Mn, 0.05%Mo, 1%Zn) at the rate of 1 gram of Osmocote and 0.20 gram of Micromax per container.[14] Seeds sown on surface, covered in light layer of media.
Establishment Phase Details	Media kept moist during establishment. Germination began after roughly 3 days. First true leaves occurred at 2 weeks.
Length of Establishment Phase	3-4 weeks[2]
Active Growth Phase	Rapid shoot and root growth occured 2-4 weeks after initial germination. *O. villosa* and *O. flava* protocols fertilized with 20-20-20 liquid NPK at 100 ppm weekly during the growing season.[14, 15]
Length of Active Growth Phase	3 months
Hardening Phase	*O. villosa, O. flava, and O. caespitosa* fertilized with 10-20-20 liquid NPK at 200 ppm in early fall. Containers are leached with water. Irrigation is gradually reduced through September and October.[14, 15, 16] Final watering before winterization.
Length of Hardening Phase	1-2 months

Harvesting, Storage and Shipping	Overwintered in outdoor nursery under insulating foam cover and snow. Harvested late summer, early fall.
Length of Storage	5 months
Guidelines for Outplanting / Performance on Typical Sites	High drough tolerance, fire tolerance. Adapted to medium and coarse textured soils.[7] Blooms May-September, flowers open once near sunset.[1] Grows up to 2 feet tall.
Other Comments	Little information exists on propagation of *O. pallida* and how protocols should be adapted to account for the differences between different *O. pallida* subspecies. The above protocol is largely based on existing propagation studies conducted with other species in genus *Oenothera*.
INFORMATION SOURCES	
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Protocol Author	Derek Cullen
Date Protocol Created or Updated	04/30/24

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