

**Plant Propagation Protocol for [Insert Species]**

ESRM 412 – Native Plant Production

URL: [https://courses.washington.edu/esrm412/protocols/\[2024\]/\[VELI.pdf\]](https://courses.washington.edu/esrm412/protocols/[2024]/[VELI.pdf])

TAXONOMY	
Plant Family	Verbenaceae
Scientific Name	<i>Verbena litoralis</i>
Common Name	Seashore Veraine
Species Scientific Name	<i>Verbena bonariensis litoralis</i>
Scientific Name	Verbena litoralis Kunth
Varieties	Not applicable
Sub-species	Not applicable
Cultivar	Reportedly in Australia (POWO)
Common Synonym(s)	None
Common Name(s)	Seashore Vervain, Brazilian Vervain, Blue Vervain (USDA)
Species Code (as per USDA Plants database)	VELI
GENERAL INFORMATION	
Geographical range	Introduced in California, Oregon Texas, Arkansas, Louisiana Georgia, Florida Hawaii (USDA)  Native to Western United States Tropical Zones (UH at Manoa)
Ecological distribution	Moist meadows, thickets, coastal areas, riversides, marshes and river-bottom prairies (USDA)
Climate and elevation range	Tropical or Chaparral Climates Coastal Habitats (USDA)
Local habitat and abundance	Can grow abundantly in clear cut and moist ecosystems Native to tropical areas of Western US and Hawaii (UH Manoa)
Plant strategy type / successional stage	Early succession, does well in high light and moist conditions Hardy and drought resistant (UC Davis)
Plant characteristics	Forb, Herbaceous flowering plant (USDA)
PROPAGATION DETAILS: FROM SEED	
Ecotype	Coastal Habitat (USDA)
Propagation Goal	Landscape use, Restoration, Research

Propagation Method	Sexual propagation (US Fish and Wildlife)
Product Type	Bareroot
Stock Type	Seedling
Time to Grow	2-3 weeks
Target Specifications	1 meter tall, dense flowers Lower leaves about 10 x 2.5 cm (PlantNet)
Propagule Collection Instructions	Small brown seeds should be found where flowers died, late fall Remove seeds and place in a dark, airy place to dry for one week (UH Manoa)
Propagule Processing/Propagule Characteristics	Likely orthodox seeds Seeds viable 1-2 years at best (POWO)
Pre-Planting Propagule Treatments	Chill for 10 days prior to planting Effective Dormancy treatments include scarification, cold stratification (Fruition Seeds)
Growing Area Preparation / Annual Practices for Perennial Crops	Relatively dry soil with slightly acidic to neutral soil (5.8 to 7.2) Peat Moss (CAB International) Container = Ray Leach stubby cell
Establishment Phase Details	Sowing, Moisture management, Cover seeds, Thinning, Fertilizer for optimal growth Cool (60 degrees) nights Warm (86 degrees) days (Fruition Seeds)
Length of Establishment Phase	2-4 weeks
Active Growth Phase	Watering Fertilization Pruning Deadheading Pest and Disease management Mulching Monitor and Maintenance
Length of Active Growth Phase	Early Spring to Late spring/ Early Summer 2-10 weeks (POWO)
Hardening Phase	Limit water and fertilizers Pruning Mulching Protective Cover Monitor Climate Gradual Acclimation
Length of Hardening Phase	Late summer to early fall

Harvesting, Storage and Shipping	<p>Harvest = Seedlings are cleaned, excess soil removed Packaged in trays, pots, or cones. Packaging should be sturdy for transport but also breathable for soil</p> <p>Storage = Conditions should mimic coastal climate that plant is native to and found in (50-60 degrees F)</p> <p>Shipping = Seedling should remain upright, shipped via expedited shipping to mitigate stress factors</p> <p>(NRCS, PlantNet, UC Davis)</p>
Length of Storage	Minimal time is best, but 2-3 weeks of storage maximum (CalFlora)
Guidelines for Outplanting / Performance on Typical Sites	<p>Outplant after last frost date</p> <p>Sunny location with good air circulation</p> <p>Place seedlings in holes similar to size of their pot</p> <p>Water to settle the soil around the plant</p> <p>Apply a layer of organic mulch</p>
Other Comments	Some sources say to chill for 10 days prior to sowing (PlantNet)
<b>PROPAGATION DETAILS: VEGETATIVE</b>	
Ecotype	Coastal Habitat (USDA)
Propagation Goal	Cuttings
Propagation Method	Vegetative
Product Type	Bareroot
Stock Type	Vegetative propagation
Time to Grow	4-6 weeks (UC Davis)
Target Specifications	<p>1 meter tall, dense flowers</p> <p>Lower leaves about 10 x 2.5 cm (PlantNet)</p>
Propagule Collection Instructions	<p>Healthy parent plants</p> <p>Collect cuttings during active growth (spring)</p> <p>Make diagonal cut, ensure stem has a node for new root to form</p>
Propagule Processing/Pro pagule Characteristics	<p>Stem cuttings, 4-6 inches long</p> <p>Ensure cutting has a node so root growth is enabled</p>
Pre-Planting Propagule Treatments	Plant immediately or as soon as possible after cutting (PlantNet)
Growing Area Preparation / Annual Practices for Perennial Crops	<p>Well draining, sterile soil</p> <p>Keep media moisture level consistent and high</p> <p>Media: Perlite and Peat Moss (CalFlora)</p>
Establishment Phase Details	<p>Sowing, Moisture management, Cover seeds, Thinning, Fertilizer for optimal growth</p> <p>Cool (60 degrees) nights</p>

	Warm (86 degrees) days
Length of Establishment Phase	2-4 weeks
Active Growth Phase	Watering Fertilization Pruning Deadheading Pest and Disease management Mulching Monitor and Maintenance
Length of Active Growth Phase	Early Spring to Late spring/ Early Summer 2-10 weeks
Hardening Phase	Limit water and fertilizers Pruning Mulching Protective Cover Monitor Climate Gradual Acclimation
Length of Hardening Phase	Mid summer to early fall (IRC)
Harvesting, Storage and Shipping	Harvest = Seedlings are cleaned, excess soil removed Packaged in trays, pots, or cones. Packaging should be sturdy for transport but also breathable for soil  Storage = Conditions should mimic coastal climate that plant is native to and found in (50-60 degrees F)  Shipping = Seedling should remain upright, shipped via expedited shipping to mitigate stress factors  (NRCS, PlantNet, UC Davis)
Length of Storage	Minimal time is best, but 2-3 weeks of storage maximum (IRC)
Guidelines for Outplanting / Performance on Typical Sites	Outplant after last frost date Sunny location with good air circulation Place seedlings in holes similar to size of their pot Water to settle the soil around the plant Apply a layer of organic mulch
Other Comments	
<b>INFORMATION SOURCES</b>	
References	1. CAB International. "Verbena litoralis as a: seashore vervain." Crop Protection Compendium. Accessed April 29, 2024. <a href="https://www.cabidigitallibrary.org/doi/10.1079/cabicompendium.117794#:~:text=litoralis%20as%20a%3A,1%20m%20tall.">https://www.cabidigitallibrary.org/doi/10.1079/cabicompendium.117794#:~:text=litoralis%20as%20a%3A,1%20m%20tall.</a>

	<p>2. USDA, NRCS. "Plant profile for <i>Verbena litoralis</i> Kunth seashore vervain." The PLANTS Database. Accessed April 29, 2024. <a href="https://plants.sc.egov.usda.gov/home/plantProfile?symbol=VELI">https://plants.sc.egov.usda.gov/home/plantProfile?symbol=VELI</a>.</p> <p>3. Fruition Seeds. "Organic Blue Vervain (<i>Verbena hastata</i>).\" Fruition Seeds. Accessed April 29, 2024. <a href="https://www.fruitionseeds.com/shop/herbs/vervain/organic-blue-vervain/">https://www.fruitionseeds.com/shop/herbs/vervain/organic-blue-vervain/</a>.</p> <p>4. Awesome Blossom Plants. "Verbena litoralis - Seashore Vervain." Awesome Blossom Plants. Accessed April 29, 2024. <a href="https://www.awesomeblossomplants.com/product-page/verbena-litoralis-seashore-vervain">https://www.awesomeblossomplants.com/product-page/verbena-litoralis-seashore-vervain</a>.</p> <p>5. Tropical Forages. "Verbena litoralis (Jacq.) Briq." Tropical Forages. Accessed April 29, 2024. <a href="https://tropical.theferns.info/viewtropical.php?id=Verbena+litoralis">https://tropical.theferns.info/viewtropical.php?id=Verbena+litoralis</a>.</p> <p>6. Nagata, Matthew, and Julie S. Denslow. "Verbena litoralis." College of Tropical Agriculture and Human Resources, University of Hawaii at Manoa. Accessed April 29, 2024. <a href="https://www.ctahr.hawaii.edu/invweed/WeedsHI/W_Verbena_litoralis.pdf">https://www.ctahr.hawaii.edu/invweed/WeedsHI/W_Verbena_litoralis.pdf</a>.</p> <p>7. Calflora. "Verbena litoralis Kunth." Calflora. Accessed April 29, 2024. <a href="https://www.calflora.org/app/taxon?crn=8236">https://www.calflora.org/app/taxon?crn=8236</a>.</p> <p>8. California Weed Science Society. "Verbena litoralis." Weed Research &amp; Information Center, University of California, Davis. Accessed April 29, 2024. <a href="https://wric.ucdavis.edu/information/crop/natural%20areas/wr_V/Verbena_litoralis.pdf">https://wric.ucdavis.edu/information/crop/natural%20areas/wr_V/Verbena_litoralis.pdf</a>.</p> <p>9. PlantNet. "Verbena litoralis Kunth." Plant Identification. Accessed April 29, 2024. <a href="https://identify.plantnet.org/k-world-flora/species/Verbena%20litoralis%20Kunth/data">https://identify.plantnet.org/k-world-flora/species/Verbena%20litoralis%20Kunth/data</a>.</p> <p>10. Institute for Regional Conservation. "Verbena litoralis (Jacq.) Briq." IRC's Database of Plants. Accessed April 29, 2024. <a href="https://regionalconservation.org/ircs/database/plants/PlantPage.asp?TXCODE=Verblito">https://regionalconservation.org/ircs/database/plants/PlantPage.asp?TXCODE=Verblito</a>.</p> <p>11. U.S. Fish and Wildlife Service. "Seashore Vervain (<i>Verbena litoralis</i>).\" Species Profile. Accessed April 29, 2024. <a href="https://www.fws.gov/species/seashore-vervain-verbena-litoralis">https://www.fws.gov/species/seashore-vervain-verbena-litoralis</a>.</p> <p>12. POWO (Plants of the World Online). "Verbena litoralis Kunth." Royal Botanic Gardens, Kew. Accessed April 29, 2024. <a href="https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:30007120-2">https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:30007120-2</a>.</p>
Other Sources	
Protocol Author	Matthew Reznick
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