

**Plant Propagation Protocol for *Hierochloe occidentalis***

ESRM 412 – Native Plant Production

URL: none



Source: USDA Plants database

<b>TAXONOMY</b>	
<b>Plant Family</b>	
Scientific Name	<i>Poaceae</i>
Common Name	Grass
<b>Species Scientific Name</b>	
Scientific Name	<i>Hierochloe occidentalis</i>
Varieties	None listed
Sub-species	None listed
Cultivar	None listed
Common Synonym(s)	<i>Anthoxanthum occidentale</i> (Buckl.) Veldkamp <i>Anthoxanthum occidentale</i> (Buckley) G.C. Tucker, nom. illeg. <i>Hierochloe macrophylla</i> Thurb. ex Boland. <i>Savastana macrophylla</i> (Thurb. ex Bol.) Beal <i>Torresia macrophylla</i> (Thurb. ex Bol.) Hitchc
Common Name(s)	California sweetgrass, western sweetgrass, California vanilla grass
Species Code (as per USDA Plants database)	HIOC
<b>GENERAL INFORMATION</b>	
Geographical range	See maps above
Ecological distribution	It typically grows in moist to dry forests and second-growth areas, often found east of the Cascades. This species thrives in open woodlands, meadows, and riparian zones, where it benefits from seasonal moisture while tolerating some drought conditions. <sup>3</sup>
Climate and elevation range	<i>Hierochloe occidentalis</i> (California sweetgrass) thrives in coastal and montane environments along the west coast of North America, particularly in

	California, Oregon, and Washington. It is commonly found in coniferous forests and mixed evergreen woodlands, often in moist, shaded areas. <sup>2</sup>
Local habitat and abundance	<i>Hierochloe occidentalis</i> (California sweetgrass) is found in moist to dry forests and second-growth areas, particularly along the Cascades crest in Washington and extending southward into Oregon and California. It thrives in open woodlands, meadows, and riparian zones, often benefiting from seasonal moisture while tolerating some drought conditions. <sup>3</sup>
Plant strategy type / successional stage	Seral species, that adapts to moist to dry forests, often thrives in disturbed or second-growth areas, which suggests some colonizing ability but not aggressive weediness. <sup>2</sup>
Plant characteristics	-Grass -Broad, bright green blades that grow up to 30 cm long and emit a sweet vanilla fragrance when dried. -Flowering stems can reach up to 1 meter tall, with tight clusters of spikelets - Small spikelets arranged in panicles, each containing three florets with long, protruding stamens during flowering. <sup>5</sup>
<b>PROPAGATION DETAILS: FROM SEED</b>	
Ecotype	There isn't much publicly available information on experimentally derived ecotypes for <i>Hierochloe occidentalis</i> (California sweetgrass). However, sources like Calflora and Calscape indicate that this species is native to coastal and montane forests from Washington to California, often occurring in closed-cone pine forests, mixed evergreen forests, and riparian zones
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Plug+
Stock Type	plug
Time to Grow	~12 month
Target Specifications	- Height: Ideally 30–100 cm at planting, depending on site conditions. - Root Development: Well-established rhizome system to support long-term growth. - Leaf Condition: Healthy, bright green blades with no signs of disease or stress. - Growth Habit: Clump-forming with strong tillering for resilience in restoration settings. <sup>5</sup>
Propagule Collection Instructions	Seed Collection - Timing: Seeds mature in late summer and should be collected when they turn brown and dry. - Method: Hand-strip seeds from spikelets or use gentle shaking to dislodge mature seeds. - Processing: Clean seeds by removing debris and store them in a cool, dry place to maintain viability. Rhizome Collection

	<ul style="list-style-type: none"> <li>- Timing: Best collected in early spring or fall, when plants are actively growing or entering dormancy.</li> <li>- Method: Dig up healthy rhizomes with at least 3 leaf bud shoots per section.</li> <li>- Preparation: Trim damaged roots and plant divisions into moist, well-draining soil.<sup>5</sup></li> </ul>
Propagule Processing/Propagule Characteristics	<ul style="list-style-type: none"> <li>- Seed Density: Estimates for related species suggest approximately 2,400,000 seeds per kilogram.</li> <li>- Seed Longevity: Seeds likely remain viable for 2–4 years when stored in cool, dry conditions.<sup>9</sup></li> </ul>
Pre-Planting Propagule Treatments	<ul style="list-style-type: none"> <li>- Drying: Seeds should be dried before storage to maintain viability.</li> <li>- Cold Stratification: Some sources recommend cold moist stratification at 4°C (40°F) for 8 weeks to improve germination rates.</li> <li>- Storage Conditions: Best stored in sealed containers in a low-humidity environment.<sup>9</sup></li> </ul>
Growing Area Preparation / Annual Practices for Perennial Crops	<ul style="list-style-type: none"> <li>- Prefers well-draining, organic-rich soil with moderate moisture retention.</li> <li>- Soil should be loose and friable, free of weeds, and evenly moistened to a depth of 5–7.5 cm before planting.</li> <li>- A slightly acidic to neutral pH (around 6.0–7.5) is ideal.</li> <li>- Plug trays (small containers) are commonly used for early-stage propagation.</li> <li>- Larger pots (1–2 gallons) may be used for mature plants before out planting.</li> <li>- Bareroot field-grown stock is possible for large-scale restoration efforts.<sup>9</sup></li> </ul>
Establishment Phase Details	<p>Seeding &amp; Germination Practices</p> <ul style="list-style-type: none"> <li>- Seedling Emergence: Typically occurs within 10–14 days after sowing.</li> <li>- Sowing Depth: Seeds should be surface-sown or lightly covered (~0.5 cm deep).</li> <li>- Moisture Management: Keep soil consistently moist but avoid waterlogging.</li> <li>- Light Exposure: Germination may be enhanced with indirect light rather than full sun.</li> </ul> <p>Early Seedling Care</p> <ul style="list-style-type: none"> <li>- Growth Medium: Use well-draining, organic-rich soil to support root development.</li> <li>- Temperature: Ideal germination temperatures likely range from 15–24°C.</li> <li>- Weeding: Begin routine weeding once seedlings reach 10–15 cm tall.</li> <li>- Hardening Phase: Gradually reduce irrigation to prepare plants for outplanting.<sup>9</sup></li> </ul>
Length of Establishment Phase	~10-14 days <sup>9</sup>
Active Growth Phase	<ul style="list-style-type: none"> <li>- Watering: Regular irrigation is essential, as sweetgrass prefers moist sites. Avoid waterlogging but ensure steady hydration.</li> </ul>

	<ul style="list-style-type: none"> <li>- Fertilization: Not recommended in the first year. In subsequent years, apply a low-analysis balanced granular fertilizer in early spring.</li> <li>- Weeding: Begin routine weeding once seedlings reach 10–15 cm tall to prevent competition.</li> <li>- Growth Monitoring: Plants should be observed for strong tillering and rhizome expansion.<sup>5</sup></li> </ul>
Length of Active Growth Phase	3 months <sup>9</sup>
Hardening Phase	Plan the final harvest of leaves in late summer so there is adequate time for the plants to prepare for the onset of winter. Failure to allow grass the natural hardening off eventually leads to lower, longer-term persistence and survival of the stand. <sup>9</sup>
Length of Hardening Phase	1-2 months <sup>9</sup>
Harvesting, Storage and Shipping	Bareroot stock can be lifted in spring for transplanting into suitable sites. Rhizomes can be harvested anytime for transplants into containers grown in the greenhouse. <sup>9</sup>
Length of Storage	unknown
Guidelines for Outplanting / Performance on Typical Sites	Needs a moist site with lots of sun <sup>4</sup>
Other Comments	
<b>PROPAGATION DETAILS: VEGETATIVE</b>	
Ecotype	Moist meadows, Sweet Grass Hills, Liberty co., MT.
Propagation Goal	Plants
Propagation Method	Vegetative
Product Type	containers
Stock Type	800 ml containers <sup>4</sup>
Time to Grow	6 weeks <sup>4</sup>
Target Specifications	Want height of 30-38 cm <sup>4</sup>
Propagule Collection Instructions	Rhizomatous propagation: Plant division is the most successful method of reproducing sweetgrass. Dividing a plant is accomplished by separating the individual propagules that have developed from the rhizomes from established nursery plants. Each propagule can then be placed in a container for further separation or future planting. <sup>4</sup>
Propagule Processing/Propagule Characteristics	Propagule will be rhizomes <sup>4</sup>
Pre-Planting Propagule Treatments	Take nursery stock and get rhizome divisions with 3 leaf bud shoots per rhizome. Plant rhizome divisions into individual containers. <sup>4</sup>

Growing Area Preparation / Annual Practices for Perennial Crops	Make sure that divisions are irrigated early morning so that containers are very wet and moist. <sup>4</sup>
Establishment Phase Details	Take rhizome divisions in June and put into 800 ml square containers using Promix #1 potting media which is 3:1 peat perlite with 4 grams of 13:13:13: N:P:K (Osmocote) controlled release fertilizer, along with 3 grams of micronutrient fertilizer for every 800 ml square container. <sup>4</sup>
Length of Establishment Phase	10-14 days <sup>4</sup>
Active Growth Phase	Irrigate the plant during the entire growing season; plant will be root tight after 6 weeks; plant will have grown to minimum of 4 to 6 inches. <sup>4</sup>
Length of Active Growth Phase	5 weeks <sup>4</sup>
Hardening Phase	Reduce irrigation and leach plants with clear water before winterization. <sup>4</sup>
Length of Hardening Phase	4 weeks <sup>4</sup>
Harvesting, Storage and Shipping	Can be harvested after 6 weeks from initial divisions. Store under an insulation cover. <sup>4</sup>
Length of Storage	5 months <sup>4</sup>
Guidelines for Outplanting / Performance on Typical Sites	Sweetgrass needs a very moist and sunny site with some shade <sup>4</sup>
Other Comments	
<b>INFORMATION SOURCES</b>	
References	<ol style="list-style-type: none"> <li>1. "California Sweet Grass (<i>Anthoxanthum Occidentale</i>)." <i>INaturalist</i>, 2025, <a href="http://www.inaturalist.org/taxa/75474-Anthoxanthum-occidentale">www.inaturalist.org/taxa/75474-Anthoxanthum-occidentale</a>. Accessed 27 May 2025.</li> <li>2. Calscape. "California Vanilla Grass." <i>Calscape.org</i>, 2025, <a href="http://calscape.org/Anthoxanthum-occidentale-(California-Vanilla-Grass)">calscape.org/Anthoxanthum-occidentale-(California-Vanilla-Grass)</a>. Accessed 27 May 2025.</li> <li>3. Calscape. "Sweet Grass." <i>Calscape.org</i>, 2025, <a href="http://calscape.org/Anthoxanthum-nitens-(Sweet-Grass)">calscape.org/Anthoxanthum-nitens-(Sweet-Grass)</a>. Accessed 27 May 2025.</li> <li>4. Ha, Christine. "Plant Propagation Protocol for Hierochloe Odorata." 19 Apr. 2010.</li> </ol>

	<p>5. "Hierochloe Occidentalis." <i>Wnps.org</i>, 2025, <a href="http://www.wnps.org/native-plant-directory/1531:hierochloe-occidentalis">www.wnps.org/native-plant-directory/1531:hierochloe-occidentalis</a>. Accessed 27 May 2025.</p> <p>6. "Lady Bird Johnson Wildflower Center - the University of Texas at Austin." <i>Wildflower.org</i>, 2018, <a href="http://www.wildflower.org/plants/result.php?id_plant=HIOC">www.wildflower.org/plants/result.php?id_plant=HIOC</a>. Accessed 27 May 2025.</p> <p>7. "OregonFlora." <i>Oregonflora.org</i>, 2025, <a href="http://oregonflora.org/taxa/index.php?taxon=5614">oregonflora.org/taxa/index.php?taxon=5614</a>. Accessed 27 May 2025.</p> <p>8. "USDA Plants Database." <i>Usda.gov</i>, 2025, <a href="http://plants.usda.gov/plant-profile/HIOC/sources">plants.usda.gov/plant-profile/HIOC/sources</a>. Accessed 27 May 2025.</p> <p>9. "Poaceae (Hierochloe) — Reforestation, Nurseries and Genetics Resources." <i>Rngr.net</i>, 2025, <a href="http://rngr.net/npn/propagation/protocols/poaceae-hierochloe-436">rngr.net/npn/propagation/protocols/poaceae-hierochloe-436</a>. Accessed 27 May 2025.</p> <p>10. <a href="http://www.wisdomlib.org">www.wisdomlib.org</a>. "Hierochloe Occidentalis: 1 Definition." <i>Wisdomlib.org</i>, 13 July 2022, <a href="http://www.wisdomlib.org/definition/hierochloe-occidentalis">www.wisdomlib.org/definition/hierochloe-occidentalis</a>. Accessed 27 May 2025.</p>
Other Sources Consulted	<p>11. ---. "Hierochloe - Burke Herbarium Image Collection." <i>Burkeherbarium.org</i>, 2025, <a href="http://burkeherbarium.org/imagecollection/browse.php?Genus=Hierochloe">burkeherbarium.org/imagecollection/browse.php?Genus=Hierochloe</a>. Accessed 27 May 2025.</p>
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