

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

ESRM 412 – Native Plant Production

URL: [https://courses.washington.edu/esrm412/protocols/\[year\]/\[USDA Species Code\].pdf](https://courses.washington.edu/esrm412/protocols/[year]/[USDA Species Code].pdf)



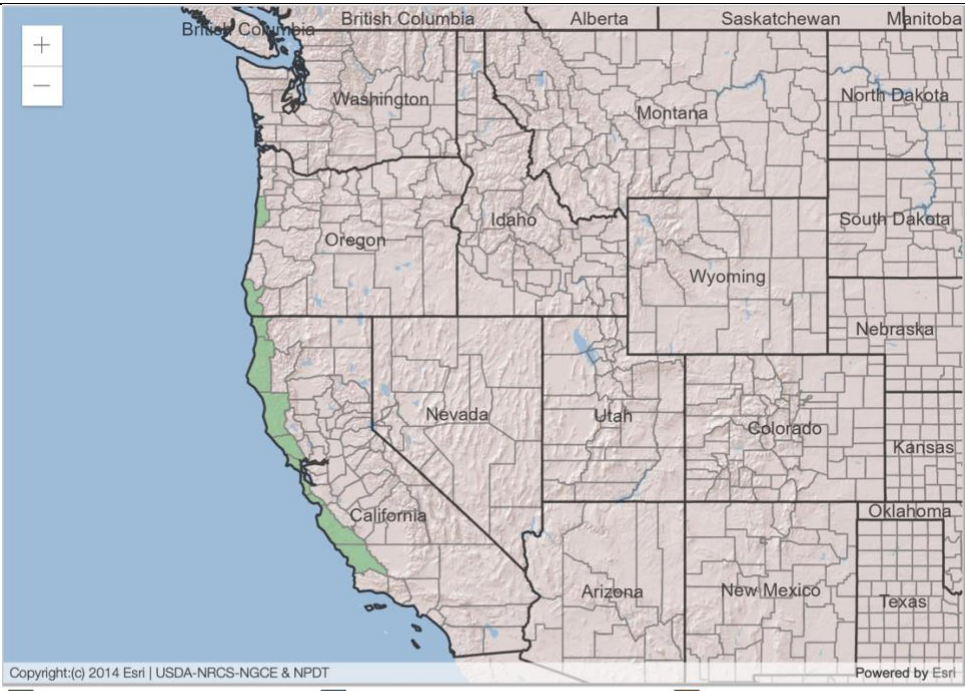
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### TAXONOMY

Plant Family	There are few propagation information about <i>Agrostis densiflora</i> , so some propagation detail listed includes information about other plants from the same genus.	
Scientific Name	Poaceae	
Common Name	Grass	
Species Scientific Name		
Scientific Name	<i>Agrostis densiflora</i> Vasey	
Varieties	No literature found	
Sub-species	No literature found	
Cultivar	No literature found	
Common Synonym(s)	<i>Agrostis californica</i> Trin. <i>Agrostis glomerata</i> auct. non (J. Presl) Kunth <i>Agrostis clivicola</i> Crampton <i>Agrostis clivicola</i> var. <i>punta-reyesensis</i> Crampton	
Common Name(s)	California bentgrass	

Species Code (as per USDA Plants database)	AGDE7(USDA)
<b>GENERAL INFORMATION</b>	
Geographical range	 <p>Copyright:(c) 2014 Esri   USDA-NRCS-NGCE &amp; NPDT Powered by Esri</p> <p>Native Status:  <input checked="" type="radio"/> L48   <input type="radio"/> AK   <input type="radio"/> HI   <input type="radio"/> PR   <input type="radio"/> VI   <input type="radio"/> NAV   <input type="radio"/> CAN   <input type="radio"/> GL   <input type="radio"/> SPM   <input type="radio"/> NA   </p>
Ecological distribution	<p><i>A. densiflora</i> grows in sandy soils, bluffs along the coast and scrublands</p> <p><i>A. densiflora</i> is the host to <i>Coenonympha tullia</i>, <i>Polites sabuleti</i>, <i>Amblyscirtes vialis</i>, and <i>Mythimna unipuncta</i>. (Calscape)</p>
Climate and elevation range	<p><i>A. densiflora</i> grows in areas with an annual precipitation of 41.1 cm – 161.8 cm. It can tolerate temperature from 3°C to 29°C, soil pH from 4.6 to 6.9. (Calflora)</p> <p>The Jepson Herbarium indicates that <i>A. densiflora</i> can survive in elevation under 200m. (Peterson &amp; Harvey , 2014)</p>
Local habitat and abundance	<i>A. densiflora</i> prefer coastal habitat like dunes and bluffs. (Calscape)
Plant strategy type / successional stage	Pioneer species

Plant characteristics	<p><i>A. densiflora</i> is a perennial grass, not rhizomatous or stoloniferous, that can grow up to 85 cm.</p> <p>The leaf of <i>A. densiflora</i> are flat and 2-10 mm wide with ligule of 1.5-2mm and proximal blades of 2-12cm.</p> <p>The flowering time of <i>A. densiflora</i> is May -August, producing flowers in color of yellow, green and purple.</p>
<b>PROPAGATION DETAILS</b>	
Ecotype	See ( <i>Agrostis scabra</i> )
Propagation Goal	Plants
Propagation Method	Seeds
Product Type	Propagules (seeds, cuttings, poles, etc.)
Stock Type	
Time to Grow	6 to 11 months (Calflora)
Target Specifications	( <i>Agrostis scabra</i> ) 142kg/ha annual production (Winslow, 2002)
Propagule Collection Instructions	( <i>Agrostis scabra</i> ) Wildland hand-harvesting seed collection happens from mid-August to early September before natural dispersal. (Winslow, 2002)
Propagule Processing/ Propagule Characteristics	( <i>Agrostis scabra</i> ) Seed is first dried for 3 to 5 days, and then processed with a Wintersteiger plot combine at concave closed with 700 rpm speed and no wind. A 4/64' round hole screen, and air-screen processed on a Clipper M2B or Eclipse cleaner over a 1-24" round hole screen is then used to further putify the seeds (Winslow, 2002).
Pre-Planting Propagule Treatments	( <i>Agrostis scabra</i> ) Seed stratification in 0-1°C for 10 days then move seeds to 22-25°C (Winslow, 2002).
Growing Area Preparation / Annual Practices for Perennial Crops	( <i>Agrostis scabra</i> ) Seeds are directly sowed in 4 inches firm and moist soil with no weeds (Winslow, 2002).
Establishment Phase Details	<p>Seeds are sowed during Spring or Fall.</p> <p>Keep soil moist during seed germination period which last about 14-16 days. No fertilization applied during establishment stage since it will stimulate weed growth. Buctryl or romoxynil can be applied at 3-5 leaf stage to control.</p>

Length of Establishm ent Phase	2 growing seasons
Active Growth Phase	Active growth phase happens from spring to fall. Weed control and moisture is important during active growth stage. 100 lbs actual N/40 lbs actual P/acre of fertilizer is applied in mid-September. Irrigation is not required during flowering.
Length of Active Growth Phase	2 or 3 growing seasons
Hardening Phase	No literature found
Length of Hardening Phase	No literature found
Harvesting, Storage and Shipping	Clipping a temporary plastic or canvas piece under belt draper for direct catchment is a way to minimize seed loss during seed harvest. Seeds are then stored in a plastic bag in cool and dry environment.
Length of Storage	5 to 7 years
Guidelines for Outplanting / Performance on Typical Sites	No literature found
Other Comments	None

### INFORMATION SOURCES

References	<p>Amme, D. (n.d.). <i>California agrostis (bentgrass)</i> - <a href="https://cnga.wildapricot.org/resources/Documents/Bibliographies%20and%20Articles/Amme%20Articles/californiaagrostis.pdf">cnga.wildapricot.org</a>. California agrostis (bentgrass). Retrieved May 24, 2022, from <a href="https://cnga.wildapricot.org/resources/Documents/Bibliographies%20and%20Articles/Amme%20Articles/californiaagrostis.pdf">https://cnga.wildapricot.org/resources/Documents/Bibliographies%20and%20Articles/Amme%20Articles/californiaagrostis.pdf</a></p> <p>USDA. (2022). <i>Agrostis densiflora</i> Vasey. USDA plants database. Retrieved May 4, 2022, from <a href="https://plants.usda.gov/home/plantProfile?symbol=AGDE7">https://plants.usda.gov/home/plantProfile?symbol=AGDE7</a></p> <p>Harvey, M. J. (n.d.). <i>Agrostis densiflora</i>. OpenHerbarium. Retrieved May 24, 2022, from <a href="https://openherbarium.org/taxa/index.php?taxauthid=1&amp;taxon=630374&amp;cl=135">https://openherbarium.org/taxa/index.php?taxauthid=1&amp;taxon=630374&amp;cl=135</a></p>
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	<p>Paul M. Peterson &amp; Michael J. Harvey (2014). <i>Agrostis densiflora</i>, in Jepson Flora Project (eds.) <i>Jepson eFlora</i>, Revision 2, <a href="https://ucjeps.berkeley.edu/eflora/eflora_display.php?tid=12273">https://ucjeps.berkeley.edu/eflora/eflora_display.php?tid=12273</a>, accessed on May 24, 2022.</p> <p>Calscape. (n.d.). <i>California bent grass, agrostis densiflora</i>. California Native Plant Society. Retrieved May 24, 2022, from <a href="https://calscape.org/loc-California/Agrostis%20densiflora%20(California%20Bent%20Grass)?newsearch=1">https://calscape.org/loc-California/Agrostis%20densiflora%20(California%20Bent%20Grass)?newsearch=1</a></p> <p>Calflora. (n.d.). <i>Plant characteristics and Associations</i>. Calflora. Retrieved May 24, 2022, from <a href="https://www.calflora.org/entry/plantchar.html?crn=141">https://www.calflora.org/entry/plantchar.html?crn=141</a></p> <p>Winslow, Susan R.. 2002. Propagation protocol for production of Propagules (seeds, cuttings, poles, etc.) <i>Agrostis scabra</i> seeds USDA NRCS - Bridger Plant Materials Center Bridger, Montana. In: Native Plant Network. URL: <a href="https://NativePlantNetwork.org">https://NativePlantNetwork.org</a> (accessed 2022/05/24). US Department of Agriculture, Forest Service, National Center for Reforestation, Nurseries, and Genetic Resources.</p> <p>Lapp, Joyce; Luna, Tara; Evans, Jeff; Wick, Dale. 2008. Propagation protocol for production of Container (plug) <i>Festuca idahoensis</i> Elmer plants 172 ml conetainers; USDI NPS - Glacier National Park West Glacier, Montana. In: Native Plant Network. URL: <a href="https://NativePlantNetwork.org">https://NativePlantNetwork.org</a> (accessed 2022/05/25). US Department of Agriculture, Forest Service, National Center for Reforestation, Nurseries, and Genetic Resources.</p> <p>Kussow, W. R., Soldat, D. J., Kreuser, W. C., &amp; Houlihan, S. M. (2012). Evidence, regulation, and consequences of nitrogen-driven nutrient demand by turfgrass. <i>ISRN Agronomy</i>, 2012, 1–9. <a href="https://doi.org/10.5402/2012/359284">https://doi.org/10.5402/2012/359284</a></p> <p>Han, N., Chen, D., Bian, H.-W., Deng, M.-J., &amp; Zhu, M.-Y. (2005). Production of transgenic creeping bentgrass <i>agrostis stolonifera</i> var. <i>Palustris</i> plants by agrobacterium <i>tumefaciens</i>-mediated transformation using hygromycin selection. <i>Plant Cell, Tissue and Organ Culture</i>, 81(2), 131–138. <a href="https://doi.org/10.1007/s11240-004-4042-5">https://doi.org/10.1007/s11240-004-4042-5</a></p> <p>Thomas, S. L., Bonello, P., Lipps, P. E., &amp; Boehm, M. J. (2006). Avenacin production in creeping bentgrass (<i>agrostis stolonifera</i>) and its influence on the host range of <i>gaeumannomyces graminis</i>. <i>Plant Disease</i>, 90(1), 33–38. <a href="https://doi.org/10.1094/pd-90-0033">https://doi.org/10.1094/pd-90-0033</a></p>
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Other Sources Consulted	
Protocol Author	Yutong Sun
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