

**Plant Propagation Protocol for Oreostemma alpigenum**  
 ESRM 412 – Native Plant Production  
 Spring 2008

<b>TAXONOMY</b>	
Family Names	
Family Scientific Name:	Asteraceae
Family Common Name:	Sunflowers
Scientific Names	
Genus:	<i>Oreostemma</i>
Species:	<i>alpigenum</i>
Species Authority:	(Torr. and A. Greene) Gray
Variety:	<i>alpigenum</i>
Authority for Variety:	Kartesz
Variety:	<i>andersonii</i>
Authority for Variety:	(A. Gray) G.L. Nesom
Variety:	<i>haydenii</i>
Authority for Variety:	(Porter) G.L. Nesom
Common Name(s):	tundra aster
Common Synonyms:	<p>Germplasm Resources Information Network lists</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> <i>Aster alpigenus</i> (Torr. &amp; A. Gray) A. Gray [= <i>Oreostemma alpigenum</i> var. <i>alpigenum</i>]</li> <li><input type="checkbox"/> <i>Aster alpigenus</i> var. <i>alpigenus</i> [= <i>Oreostemma alpigenum</i> var. <i>alpigenum</i>]</li> <li><input type="checkbox"/> <i>Aster alpigenus</i> var. <i>andersonii</i> (A. Gray) M. Peck [≡ <i>Oreostemma alpigenum</i> var. <i>andersonii</i>]</li> <li><input type="checkbox"/> <i>Aster alpigenus</i> var. <i>haydenii</i> (Porter) Cronquist [≡ <i>Oreostemma alpigenum</i> var. <i>haydenii</i>]</li> <li><input type="checkbox"/> <i>Aster andersonii</i> (A. Gray) A. Gray [≡ <i>Oreostemma alpigenum</i> var. <i>andersonii</i>]</li> <li><input type="checkbox"/> <i>Aster haydenii</i> Porter [≡ <i>Oreostemma alpigenum</i> var. <i>haydenii</i>]</li> <li><input type="checkbox"/> <i>Erigeron andersonii</i> A. Gray [≡ <i>Oreostemma alpigenum</i> var. <i>andersonii</i>]</li> <li><input type="checkbox"/> <i>Haplopappus alpigenus</i> Torr. &amp; A. Gray [≡ <i>Oreostemma alpigenum</i> var. <i>alpigenum</i>]</li> </ul>
Species Code:	ORAL4
Ecological distribution:	<i>Oreostemma alpigenum</i> is found in Washington, Oregon, California, Nevada, Montana, Wyoming, Idaho (USDA PLANTS). It is found in mountainous or hilly areas (USDA PLANTS, Calflora).
Climate and elevation range:	In California, <i>Oreostemma alpigenum</i> is found between 4,000 and 11,500 feet elevation (Calflora). At Mount Rainier, it is found between 5,000 and 8,000

	feet (Biek 2000). At Mount Adams it is found to 6,400 feet (Biek and McDougall 2007).
Local habitat and abundance:	<i>Oreostemma alpigenum</i> is primarily found in subalpine meadows. It is common and locally abundant (Pojar and MacKinnon 1994). It is also found in yellow and lodgepole pine forests, red fir forests, subalpine forests, fell-fields and riparian or wetland areas (Calflora).
Plant characteristics:	<i>Oreostemma alpigenum</i> is a forb. It is a dwarf perennial herb from an erect stem-base and taproot. 10-40 violet or lavender ray flowers; yellow disc flowers; overlapping involucre bracts with hairy margins; solitary heads (Pojar and MacKinnon 1994).
<b>PROPAGATION DETAILS</b>	
Because no specific protocols are available for this species, recommendations are based on <i>Symphyotrichum spathulatum</i> (Lindl.) Both species were classified as <i>Aster</i> until recently and inhabit the Cascade Range. <i>S. spathulatum</i> (Lindl.) protocol by USDA NRCS (Skinner).	
Ecotype:	Paradise Creek drainage near Pullman, WA (Skinner).
Propagation Goal:	Plants (Skinner).
Propagation Method:	Kruckeberg (1982) says that asters are easily propagated from seed or root division.
Product Type:	Skinner produced containers (plugs).
Time to Grow:	4 Months (Skinner).
Target:	Tight root plug in container (Skinner).
Propagule Collection:	<i>Oreostemma alpigenum</i> flowers from mid to late summer (Larrison et al. 1974). <i>S. spathulatum</i> seeds are collected when the pappus expands. Seed is wind disseminated, so must be collected before it blows away. Seed maturity is indeterminate. Seed can be collected using a vacuum cleaner. This only removes mature seed, leaving immature seed to ripen (Skinner).
Propagule Processing/Propagule Characteristics:	Harvested seed is stored in paper bags at room temperature until cleaned. Plants in seed increase plantings can be cut and dried under cover on tarps, but must be protected from wind. Whole plants should never be collected from the wild. Small amounts of seed are rubbed over a 10 mesh screen to remove the pappus, then cleaned with an air column separator. Larger amounts are run thru a hammermill, then cleaned with air screen equipment. Sterile rice hulls can be added to the hammermill to facilitate removal of the pappus. This is not necessary if there are stems and leaves collected with the seed. Cleaned seed is stored at 40 degrees F. and 40% relative humidity (Skinner).
Pre-Planting Propagule Treatments:	None (Skinner).
Growing Area Preparation / Annual Practices for Perennial Crops:	In January seed is sown in the greenhouse in 10 cu. in. Ray Leach Super cell conetainers filled with Sunshine #4 and covered lightly. Head space of ¼ to ½ inch is maintained in conetainers to allow deep watering. A thin layer of pea gravel is applied to prevent seeds from floating. Conetainers are watered deeply (Skinner).
Establishment Phase:	Medium is kept moist until germination occurs. Germination usually occurs in 8-10 days and is complete in 14-18 days (Skinner).
Length of	3 weeks (Skinner).

Establishment Phase:	
Active Growth Phase:	Plants are watered deeply every other day and fertilized once per week with a complete, water soluble fertilizer containing micronutrients (Skinner).
Length of Active Growth Phase:	2 months (Skinner).
Hardening Phase:	Plants are moved to a cold frame in late March or early April, depending on weather conditions (Skinner).
Length of Hardening Phase:	4 weeks (Skinner).
Guidelines for Outplanting / Performance on Typical Sites:	Transplanting is done in early May by using an electric drill and portable generator to drill 1.5 inch diameter holes at the planting site. Survival in seed increase plantings without competing vegetation approaches 100%. Transplanting into sites with existing vegetation reduces survival and vigor depending on weather conditions following planting. Flowering and seed production occurs the same year as transplanting (Skinner).
Other Comments:	Plants produce prodigious amounts of seed and reseed themselves readily. Plants continue to produce good seed crops in increase plantings for at least 4 years. Plants are mildly rhizomatous and probably can be propagated by division. This method should only be used for plants growing in cultivation. Plants should not be dug up from stands in the wild (Skinner).
<b>INFORMATION SOURCES</b>	
References:	<ol style="list-style-type: none"> <li>1. Biek, D. 2000. <i>Flora of Mt. Rainier National Park</i>. Corvallis, OR: Oregon State University Press.</li> <li>2. Biek, D. and S. McDougall. 2007. <i>The Flora of Mount Adams</i>, Washington. Seattle, WA: Sound Books.</li> <li>3. Calflora <a href="http://www.calflora.org/cgi-bin/species_query.cgi?where-calrecnum=766">http://www.calflora.org/cgi-bin/species_query.cgi?where-calrecnum=766</a> Accessed 30 April 2008</li> <li>4. California Native Plant Link Exchange <a href="http://www.cnplx.info/nplx/species?taxon=Aster+alpigenus+var.+andersonii1">http://www.cnplx.info/nplx/species?taxon=Aster+alpigenus+var.+andersonii1</a>. Accessed 29 April 2008</li> <li>5. Germplasm Resources Information Network <a href="http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?434156">http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?434156</a> Accessed 21 April 2008</li> <li>6. Kruckeberg, A. R. 1982. <i>Gardening with Native Plants of the Pacific Northwest: An Illustrated Guide</i>. Seattle: University of Washington Press.</li> <li>7. Larrison, E. J., Patrick, G. W., Baker, W. H., and J. A. Yaich. 1974.</li> </ol>

	<p><i>Washington Wildflowers</i>. Seattle: Seattle Audobon Society.</p> <p>8. Pojar, J. and A. MacKinnon eds. 1994. <i>Revised Plants of the Pacific Northwest Coast</i>. Vancouver, B.C.: Lone Pine.</p> <p>9. Skinner, D. Protocol: <i>Symphyotrichum spathulatum</i> (Lindl.) Nesom (Gray) Nesom. USDA NRCS - Pullman Plant Materials Center.  <a href="http://www.nativeplantnetwork.org/network/view.asp?protocol_id=2157">http://www.nativeplantnetwork.org/network/view.asp?protocol_id=2157</a>  Accessed 30 April</p> <p>10. USDA PLANTS database  <a href="http://plants.usda.gov/java/profile?symbol=ORAL4">http://plants.usda.gov/java/profile?symbol=ORAL4</a>  Accessed 29 April 2008</p>
Protocol Author:	Rachel Sewell Nesteruk
Date Protocol Created or Updated:	04/30/08

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