Plant Propagation Protocol for *Sericocarpus rigidus (Aster curtus)*
ESRM 412 – Native Plant Production
Protocol URL: https://courses.washington.edu/esrm412/protocols/*SERI4.pdf*
Revision of previous protocol: http://depts.washington.edu/propplnt/Plants/Acurtus.htm

Illustration 1: Distribution along North America.

Illustration 2: Distribution in Washington state

Source: USDA PLANTS database

TAXONOMY	
Plant Family	
Scientific Name	Asteraceae
Common Name	Aster, daisy
Species Scientific Name	
Scientific Name	*Sericocarpus rigidus* Lindl.
Varieties	
Sub-species	
Cultivar	
Common Synonym(s)	*Aster curtus* Cronquist
Common Name(s)	Columbian whitetop aster, white-topped aster, white-top aster
Species Code (as per USDA Plants database)	SERI4 or ASCU2
GENERAL INFORMATION	
Geographical range	Native to British Columbia, Washington state, and Oregon state (USDA PLANTS). See above illustrations for North American distribution and Washington state distribution.
Ecological distribution	Praries and open areas at low elevations (Burke Museum).
Climate and elevation range	Grasslands between 10-240m (Zevit & Fairbarns 2007).
Local habitat and abundance	Rare and endangered species (Clampitt 1987). "Occurs in open grassland habitats in the Willamette-Puget Trough. A majority of the occurrences occur in gravelly, glacial outwash soils. However, in the southern and northern portions of its range, it occurs in the clayey and exposed bedrock habitats, respectively. The general requirement appears to be open, non-forested habitats that are seasonally mesic but somewhat moisture stressed during late summer" (Gamon 2006). Can be found growing from full sun on open praries to areas up to 30% shade on shaded sites (Thomas & Carey 1996) Common in soils with 20-50 cm deep organic horizons over well-drained, gravelly, glacial outwash (Thomas & Carey 1996). May be found in understories of *Cytisus scoparius, Holodiscus discolor,* and *Symphoricarpos albus* (Gamon 2006). Present in areas of mixed grasses: *Aira praecox*, *Dactylis glomerata*, *Poa sp.*, *Cynosurus echinatus*, and *Anthoxanthum odoratum* (Gamon 2006).

Plant strategy type / successional stage	Stress tolerator (Clampitt 1987).
Plant characteristics	Perennial herb, grows from “creeping rhizome”. 4-12 in tall. Leaves 2.5-3.5 cm long. Pale yellow disc flowers with purple anthers (Gamon 2006). Grown plants are found in clumps due to rhizome spread patterns (Thomas & Carey 1996)

PROPAGATION DETAILS	
Frey, Brenda, Chaim Kempler, and David L. Ehret. "Micro-Propagation of White-top Aster, Sericocarpus Rigidus, a Threatened Species from the Garry Oak Ecosystem in British Columbia."	
Ecotype	Garry Oak ecosystem in coastal British Columbia
Propagation Goal	Propagules
Propagation Method	Vegetative
Product Type	In-vitro
Growing Area Preparation / Annual Practices for Perennial Crops	“Modified Murashige and Skoog media (MS) with various concentrations of benzylaminopurine (BAP) and gibberellic acid (GA3), followed by media containing IAA and kinetin at concentrations of 2mg/liter”
Other Comments	Article is behind paywall. Only information from abstract was gathered. Study shows in-vitro shoot multiplication is possible, but methods used cannot be confirmed without article access.

PROPAGATION DETAILS	
Thomas, T.B., and A.B. Carey. "Endangered, Threatened, and Sensitive Plants of Fort Lewis, Washington: Distribution, Mapping, and Management Recommendations for Species Conservation."	
Ecotype	Prairie, prairie-margin woodlands
Propagation Goal	N/a; study was observing presence of plant
Product Type	Bareroot
Stock Type	
Time to Grow	Not specified.
Target Specifications	Grown plants are always found in clumps due to rhizome spread pattern.
Growing Area Preparation / Annual Practices for Perennial Crops	All populations found occurred on broken topography: “mounds, small rises, and swales”. Soils had 20-50 cm deep organic horizons over well-drained, gravelly, glacial outwash (Thomas & Carey 1996).

	Shade cover ranged from full sun on open prairie sites and 30% shade in shaded sites.
Other Comments	Study finds conditions of *S. rigidus* soil type and topography. Some information on how grown plants are seen in wild and the amount of shade tolerable for it. No information on harvest, storage, transport, growth phases, establishment, or outplanting.

PROPAGATION DETAILS	
Clampitt, Christopher A. "Reproductive Biology of Aster Curtus (Asteraceae), a Pacific Northwest Endemic."	
Ecotype	Location 10km from Rocky Prairie fall of 1983.
Propagation Goal	Germinants
Propagation Method	Seed
Product Type	In-vitro grown
Stock Type	
Propagule Collection Instructions	Seeds were collected in the fall of 1983
Propagule Processing/Propagule Characteristics	On Jan 1984, seeds were placed in moist peat moss to stratify for 45 days at 5 C. Only seeds that looked full and resisted a gentle pinch with forceps were used for planting (Clampitt 1987).
Pre-Planting Propagule Treatments	Seeds stored at room temperature in paper bags until ready to be used. Seeds were stratified in either 10 C, 20 C, or 32 C temperature with a 16 hour photoperiod. Alternative temperature using growth chambers used a 16 hr day at 20 C and 8 hr night at 10 C, testing stratified seeds, unstratified seeds, and unstratified seeds in constant darkness. Constant darkness was done through wrapping petri dishes in foil.
Growing Area Preparation / Annual Practices for Perennial Crops	Moist filter paper in petri dishes
Establishment Phase Details	10 C stratified seeds with light took 5 days to germinate 50%. 20 C stratified seeds with light took less than 2 days to germinate 50%. 32 C stratified seeds with light took less than 2 days to germinate 50%. The growth chamber unstratified seed seeds took 11 days for 50% to germinate. Seeds failed to germinate 50% in dark conditions.

Other Comments	Study was performed to see if germination was possible under various different conditions. No information on seedling storage, transfer, outplanting, or hardening was present.

PROPAGATION DETAILS	
Clampitt, Christopher A. "Reproductive Biology of Aster Curtus (Asteraceae), a Pacific Northwest Endemic."	
Ecotype	Location 10km from Rocky Prairie fall of 1983.
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Container
Stock Type	
Time to Grow	Seeds were grown for a total of 13 weeks before roots and shoots were harvested for destructive measurements for data.
Target Specifications	Not listed
Propagule Collection Instructions	Seeds were collected in fall of 1983
Propagule Processing/Propagule Characteristics	
Pre-Planting Propagule Treatments	Seeds were stratified for 55 days at 5 C in moist peat moss.
Growing Area Preparation / Annual Practices for Perennial Crops	10.5 cm plastic pots with soil from local prairie site seeds were collected from. Five seedlings are planted in each pot.
Establishment Phase Details	14g fertilizer of 20-20-20 (NPK) in 10 L of water applied every three weeks
Length of Establishment Phase	
Other Comments	This information details the control data group from an experiment to see competition on *S. rigidus*. *S. rigidus* was found to be a poor competitor versus introduced grasses from its sites. Seedlings are most likely to establish in unoccupied microsites, with minimal competition (Clampitt 1987).

PROPAGATION DETAILS	
Ewing, Kern. "Mounding as a Technique for Restoration of Prairie on a Capped Landfill in the Puget Sound Lowlands."	
Ecotype	Not specified
Propagation Goal	Plant
Propagation Method	Seed
Product Type	Container-field hybrid
Stock Type	
Time to Grow	Not specified
Target Specifications	Not specified
Propagule Collection Instructions	Not specified
Propagule Processing/Propagule Characteristics	Not specified
Pre-Planting Propagule Treatments	Not specified
Growing Area Preparation / Annual Practices for Perennial Crops	10-cm pots in non-soil medium; either sand, peat, moss, or vermiculite.
Establishment Phase Details	Not specified
Length of Establishment Phase	
Active Growth Phase	Not specified
Length of Active Growth Phase	
Hardening Phase	Not specified
Length of Hardening Phase	Not specified
Harvesting, Storage and Shipping	Not specified
Length of Storage	Not specified
Guidelines for Outplanting / Performance on Typical Sites	Plants grow greater total stem length and branch length on mounded plots. Mounded plots reduce mortality rate of outplanting. After 3 years, 60% of *S. rigidus* will survive on site; flowering time not specified.
Other Comments	This experimental study observed growth of various nursery grown plants and outplanting them in the capped landfill known as the Union Bay Natural Area. Limited information is known on how *S. rigidus* were grown, but some data on outplanting is present.

INFORMATION SOURCES	
References	See below
Other Sources Consulted	See below
Protocol Author	Jamie Lei
Date Protocol Created or Updated	05/25/17

References

Clampitt, Christopher A. "Reproductive Biology of Aster Curtus (Asteraceae), a Pacific Northwest Endemic." American Journal of Botany 74.6 (1987): 941-46. Web. 25 May 2017. <http://www.jstor.org/stable/2443875>.

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Mentions *S. rigidus* but study primarily focuses on different species.