Plant Propagation Protocol –*Heracleum maximum*

ESRM 412 – Native Plant Production

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Spring 2007

TAXONOMY	
Family Names	
Family Scientific Name:	*Apiaceae*
Family Common Name:	Carrot Family
Scientific Names	
Genus:	*Heracleum*
Species:	*maximum*
Species Authority:	Bartr.
Variety:	
Sub-species:	
Cultivar:	
Authority for Variety/Sub-species:	
Common Synonym(s)	
Genus:	*Heracleum*
Species:	*lanatum, sphondylium*
Species Authority:	Michx., L.
Variety:	*Lanatum (sphondylium)*
Sub-species:	*montanum (sphondylium)*
Cultivar:	
Authority for Variety/Sub-species:	(Michx.) Dorn /(Schleich. ex Gaudin) Briq.
Common Name(s):	Common cowparsnip, cow parsnip
Species Code (as per USDA Plants database):	HEMA80
GENERAL INFORMATION	
General Distribution (geographical range (states it occurs in), ecosystems, etc):	*H. maximum* is found throughout North America. It occurs along streambanks and in moist ground from lowland coniferous forests to the subalpine zone. (Glacier National Park 2006)
Climate and elevation range	
Local habitat and abundance; may include commonly associated species	From sea level to montane, typically in moist sites (bogs, seeps, streamsides, or damp open meadows). (Kruckeberg 1996) Statewide excluding Palouse, Central WA, and mid-coastal WA. (plants.usda.gov.)
Plant strategy type / successional stage (stress-tolerator, competitor, weedy/colonizer, seral, late	Wetland accent / biennial (Kruckeberg 1996) Perennial (plants.usda.gov)

successional)	
PROPAGATION DETAILS	
Ecotype (this is meant primarily for experimentally derived protocols, and is a description of where the seed that was tested came from):	Streambank adjacent to Cedar forest, Avalanche,Glacier National Park, Flathead County, MT. 1030 meters (GNP 2006)
Propagation Goal (Options: Plants, Cuttings, Seeds, Bulbs, Somatic Embryos, and/or Other Propagules):	Plants
Propagation Method (Options: Seed or Vegetative):	Seed
Product Type (options: Container (plug), Bareroot (field grown), Plug + (container-field grown hybrids, and/or Propagules (seeds, cuttings, poles, etc.))	Container (plug)
Stock Type:	172 ml conetainers (GNP 2006)
Time to Grow (from seeding until plants are ready to be outplanted):	18 months
Target Specifications (size or characteristics of target plants to be produced):	Height: 6 cm, 4 to 6 true leaves Caliper: n/a Root System: firm plug in conetainer (GNP 2006)
Propagule Collection (how, when, etc):	Seeds are hand collected when the schizocarps turn tan in late August. Paper bags are used for collection and seeds are kept in well ventilated drying shed prior to cleaning. Collection Locality: Avalanche (GNP 2006)
Propagule Processing/Propagule Characteristics (including seed density (# per pound), seed longevity, etc):	Seed longevity estimated at 3 years in sealed containers at 1C. Seed dormancy is classified as nondeep morphological-physiological dormancy. % Purity: 100% % Germination: 89% (GNP 2006) 58517 seed/lb. (plants.usda.gov)
Pre-Planting Propagule Treatments (cleaning, dormancy treatments, etc):	Seeds are cleaned using an air blower and screens. 72 hour water soak of fresh seed; water was changed daily followed by a 100 day cold moist stratification. Seeds were placed in fine mesh bags and buried in moist peat moss in a ventilated container under refrigeration at 3C. The running water presoak treatment is necessary for adequate germination; calcium oxalate and other inhibitors are present in the seed coat and must be leached out. (GNP 2006)
Growing Area Preparation / Annual Practices for Perennial Crops (growing media, type and size of	Greenhouse and outdoor nursery growing facility. Sowing Method: Direct Seeding. Seeds are sown by hand and lightly covered with media.

containers, etc):	Growing media used is 50% milled spaghnum peat, perlite, and vermiculite with Osmocote controlled release fertilizer (13N:13P2O5:13K2O; 8 to 9 month release rate at 21C) and Micromax fertilizer (12%S, 0.1%B, 0.5%Cu, 12%Fe, 2.5%Mn, 0.05%Mo, 1%Zn) at the rate of 1 gram of Osmocote and 0.20 gram of Micromax per 172 ml conetainer. (GNP 2006)
Establishment Phase (from seeding to germination):	Seeds did not germinate the 1st year, conetainers were placed in the outdoor nursery for the remainder of the growing season and were winterized outdoors. Initial germination the following spring appeared uniform and occurred following several days of temperatures at 22C or above during the day and 13C to 16C at night in early June in the outdoor nursery. Conetainers are misted twice per day during the establishment phase. (GNP 2006)
Length of Establishment Phase:	4 Weeks
Active Growth Phase (from germination until plants are no longer actively growing):	Root and shoot development occurs rapidly following germination. 4 to 6 true leaves were evident 3 weeks after germination. Plants were fertilized with 13-13-13 NPK liquid fertilizer at 100 ppm during the growing season. Seedlings are irrigated with Rainbird automatic irrigation system in early morning until containers are thoroughly leached. Leaves are large and irrigation becomes difficult in conetainers; it is necessary to uppot to 3 L (1 gallon) containers if stock is to be held overwinter. (GNP 2006)
Length of Active Growth Phase:	8 Weeks
Hardening Phase (from end of active growth phase to end of growing season; primarily related to the development of cold-hardiness and preparation for winter):	Irrigation is gradually reduced in September and October. Plants are flushed with clear water and fertilized with 10-20-20 NPK liquid fertilizer at 200 ppm once before winterization. (GNP 2006)
Length of Hardening Phase:	4 Weeks
Harvesting, Storage and Shipping (of seedlings):	Total Time to Harvest:1.5 years Harvest Date: August Storage Conditions: Overwinter in outdoor nursery under insulating foam cover and snow. (GNP 2006)
Length of Storage (of seedlings, between nursery and outplanting):	5 Months
Guidelines for Outplanting / Performance on Typical Sites (eg, percent survival, height or diameter growth, elapsed time before flowering):	Outplanting Site:Logan Pass, Glacier National Park, MT. Outplanting Date: early September. Outplanting Survival at 3 Years: 100% (GNP 2006)
Other Comments:	3L (1 gallon) container stock can be produced in one

	growing season. (GNP 2006)
INFORMATION SOURCES	
References:	USDA NRCS Plants Database *http://www.plants.usda.gov/* Kruckeberg, A.R. 1996. *Gardening with native plants of the Pacific Northwest*. University of Washington Press, Seattle, WA Native Plants Propagation Protocol Database *http://www.nativeplantnetwork.org/network/* Native Plant Nursery Protocol Information 5/30/2006 Glacier National Park West Glacier, Montana
Other Sources Consulted (but that contained no pertinent information):	"Strategies for Seed Propogation of Native Forbs" Susan E. Meyer 2006 Pacific Northwest Native Plant Resources *http://dnr.metrokc.gov/wlr/PI/npresrcs.htm*
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