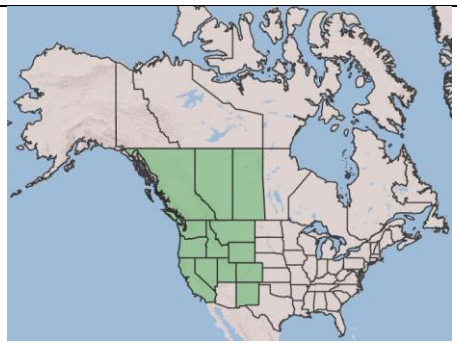
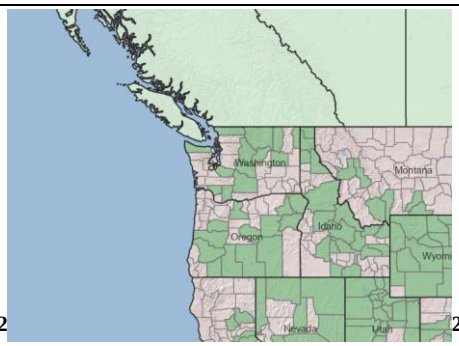
Plant Propagation Protocol for *Antennaria umbrinella*

ESRM 412 – Native Plant Production

URL: https://courses.washington.edu/esrm412/protocols/*2024*/*ANUM.pdf*

[1]

TAXONOMY	
Plant Family	
Scientific Name	*Asteraceae*
Common Name	Daisies, Asters, Sunflowers, and Allies
Species Scientific Name	
Scientific Name	*Antennaria umbrinella* Rydb.
Varieties	None
Sub-species	None
Cultivar	None
Common Synonym(s)	*Antennaria aizoides* Greene *Antennaria flavescens* Rydb. *Antennaria reflexa* E.E. Nelson [2]
Common Name(s)	Umber pussytoes Brown pussytoes
Species Code (as per USDA Plants database)	ANUM
GENERAL INFORMATION	

Geographical range	 [2]  [2]
Ecological distribution	Forest openings at middle elevations to subalpine meadows.[1] Dry sagebrush scrubs, Open yellow-pine forests[3]
Climate and elevation range	Wide climate range, mostly subalpine. Elevation ranges from ~1100-3400 meters. [4]
Local habitat and abundance	Unable to locate specific information, likely associated with other common subalpine species with similar elevation ranges and distribution maps.
Plant strategy type / successional stage	Perennial herbs, likely early-mid successional stage. No information was available on plant strategy type. [1]
Plant characteristics	Mat-forming, stoloniferous perennial forb. Grows from a woody base with stems up to 20 cm. tall. Leaves at base are up to 25 mm. long and 7 mm. wide, appear white and woolly. There are few smaller leaves on the stem. Flowers grow in compact heads and are white towards the middle and brown to yellow on the outside. [1]
PROPAGATION DETAILS BY SEED Propagation information on *Antennaria umbrinella* was scarce so most information here is regarding *Antennaria media*, a species that is described as "almost identical in every respect" [5]	
Ecotype	Subalpine meadows of Logan Pass in Glacier National Park, MT at 2032 meters of elevation. [6]
Propagation Goal	Plants [6]
Propagation Method	Seed [6]
Product Type	Container (Plug) [6]
Stock Type	Small pots/containers (160 ml) [6]
Time to Grow	~6 months [6]
Target Specifications	Target plants should be 2cm tall and have root systems that firmly plug the plant into its container. [6]
Propagule Collection Instructions	Collect mature seeds in late August at high elevations, seeds should darken as they mature, the cypsela (fruit) should separate easily from receptacles. Collect seeds in paper containers and keep in a well-ventilated drying location before being cleaned. [6] Initial source lists the fruit as an achene, however it is actually a cypsela [7]
Propagule Processing/Propagule Characteristics	Seeds should be cleaned with a hammermill and the run over by an office clipper. After cleaning seed purity should be at 100% and the germination rate for *Antennaria media* is about 80%. Seed longevity for this genus is estimated to be up to 5 years and the seeds are non-dormant. [6]

Pre-Planting Propagule Treatments	Stratify seeds for 80-150 days in a cold and moist environment. [6]
Growing Area Preparation / Annual Practices for Perennial Crops	Seeds are directly surface sown in late fall in conetainers which are irrigated thoroughly prior to stratification. [6]
Establishment Phase Details	Antennaria seedlings appear to germinate more slowly than many other forb species. Widely fluctuating temperatures during germination of this high elevation species may account for the higher fill rate of outdoor nursery sown seeds vs. greenhouse grown material. [6]
Length of Establishment Phase	4 weeks [6]
Active Growth Phase	Once seedlings are established, plants develop rapid shoot and root growth 2 to 4 weeks following germination. Plants are fertilized with 20-20-20 NPK liquid fertilizer at 100 ppm bi-weekly during the growing season. Plants are mat-forming and quickly fill containers during the rapid growth stage. [6]
Length of Active Growth Phase	8 weeks [6]
Hardening Phase	Plants are fertilized with 10-20-20 NPK liquid fertilizer at 200 ppm in early fall; pots are flushed with water, irrigation is gradually reduced through September and October. [6]
Length of Hardening Phase	4 weeks [6]
Harvesting, Storage and Shipping	The ideal harvest is in July, 6 months after sowing. Storage should take place over winter in an outdoor nursery underneath an insulating foam cover and snow. [6]
Length of Storage	5 months [6]
Guidelines for Outplanting / Performance on Typical Sites	If direct seeding into outplanting sites, the seeds mut be pressed or rolled into beds for proper establishment. [6]
Other Comments	Germination of seeds requires light. [6]
INFORMATION SOURCES	
References	[1] Herbarium, W. T. U., Burke Museum, & University of Washington. (n.d.). Antennaria umbrinella - Burke Herbarium Image Collection. Burkeherbarium.org. Retrieved May 24, 2024, from https://burkeherbarium.org/imagecollection/taxon.php?Taxon=Antennaria%20umbrinella [2] USDA Plants Database. (n.d.). *Antennaria umbrinella Rydb*. Usda.gov. Retrieved May 23, 2024, from https://plants.usda.gov/home/plantProfile?symbol=ANRE5 [3] *Antennaria umbrinella*. (n.d.). Berkeley.edu. Retrieved May 24, 2024, from https://ucjeps.berkeley.edu/eflora/eflora_display.php?tid=1059

	[4] Antennaria umbrinella in Flora of North America @ efloras.org. (n.d.). Efloras.org. Retrieved May 24, 2024, from http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=250066093 [5] Torrey Botanical Club. (1874). *Bulletin of the Torrey botanical club* (Vols. 1-5 (1870-1874)). New York, Torrey Botanical Club, 1870-1996. Retrieved May 23, 2024, from https://www.biodiversitylibrary.org/page/715743#page/392/mode/1up [6] Luna, Tara; Evans, Jeff; Wick, Dale; Hosokawa, Joy. 2008. Propagation protocol for production of Container (plug) *Antennaria media* Greene plants 160 ml containers; USDI NPS - Glacier National Park West Glacier, Montana. In: Native Plant Network. URL: https://NativePlantNetwork.org (accessed 2024/05/22). US Department of Agriculture, Forest Service, National Center for Reforestation, Nurseries, and Genetic Resources. [7] *Lady Bird Johnson Wildflower Center - the university of Texas at Austin*. (n.d.). Wildflower.org. Retrieved May 24, 2024, from https://www.wildflower.org/plants/result.php?id_plant=ANUM
Other Sources Consulted	Chmielewski, J.G., Chinnappa, C.C. & Semple, J.C. The genus *Antennaria* (*Asteraceae: Inuleae*) in western North America: Morphometric analysis of *Antennaria alborosea, A. corymbosa, A. marginata, A. microphylla, A. parvifolia, A. rosea,* and *A. umbrinella* . *Pl Syst Evol* 169, 151–175 (1990). https://doi.org/10.1007/BF00937673 *umber pussytoes (Antennaria umbrinella)*. (n.d.). iNaturalist. Retrieved May 24, 2024, from https://www.inaturalist.org/taxa/75471-Antennaria-umbrinella *Brown pussytoes (Antennaria umbrinella)*. (n.d.). Idaho.gov. Retrieved May 24, 2024, from https://idfg.idaho.gov/species/taxa/43811
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Date Protocol Created or Updated	05/23/2024