Plant Propagation Protocol for *Pyrrocoma scaberula*
ESRM 412 – Native Plant Production
Protocol URL: https://courses.washington.edu/esrm412/protocols/PYSC4.pdf

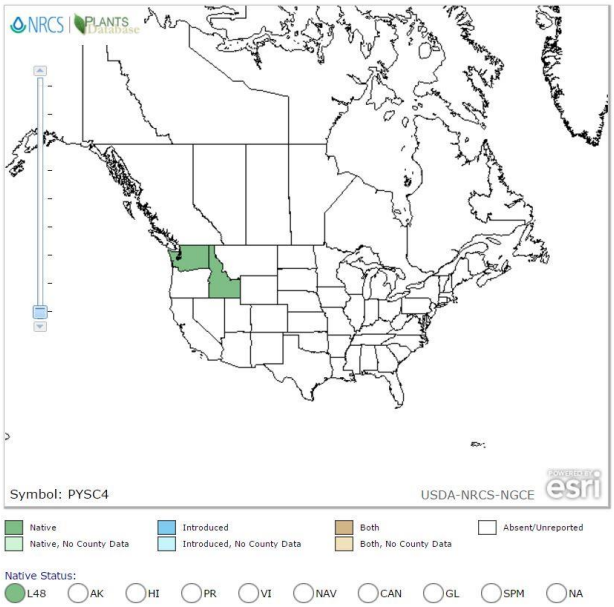

Figure 1 (left): PYSC4 distribution in North America[1]
Figure 2 (right): PYSC4 distribution in Washington State[1]

TAXONOMY[1]	
Plant Family	
Scientific Name	Asteraceae
Common Name	Aster family
Species Scientific Name	
Scientific Name	*Pyrrocoma scaberula* Greene
Varieties	
Sub-species	
Cultivar	
Common Synonym(s)	*Haplopappus integrifolius* Porter ex A. Gray ssp. *scaberulus* (Greene) H.M. Hall
Common Name(s)	Palouse goldenweed
Species Code (as per USDA Plants database)	PYSC4

GENERAL INFORMATION	
Geographical range	Found in the U.S. states of Idaho (Nez Perce, Lewis, and Idaho Counties) and southeastern Washington (Asotin County).[1,4]
Ecological distribution	Endemic to the Palouse bioregion of WA and ID, specifically the Snake River Canyon and Camas Prarie.[4] Found in same general areas in WA and ID as the genetically and morphologically-similar *Pyrrocoma liatriformis*.[2,4]
Climate and elevation range	Only found in the Palouse bioregion which experiences hot, dry summers with little precipitation and cool, wet winters.[5] Found at low to mid-elevations and on slopes <35%.[3,7]
Local habitat and abundance	Grows in native bunchgrass grasslands and open hillsides, as well as the transition zones between grasslands and ponderosa pine (*Pinus ponderosa*) or Douglas-fir (*Pseudotsuga menziesii*) forests).[3,7] An estimated 50-75 populations of the species exist.[7] Currently listed as state sensitive/rare by the Washington Natural Heritage Program as of 2011.[7,9] Extensive historical habitat loss has occurred due to agricultural conversion, invasive species, herbivory, fire suppression, fire salvage logging, and overgrazing.[7,10] Commonly associated species include:[7] Idaho fescue (*Festuca idahoensis*) bluebunch wheatgrass (*Pseudoroegneria spicata* ssp. *spicata*) arrowleaf balsamroot (*Balsamorhiza sagittata*) aspen fleabane (*Reigeron speciosus*) Sandberg bluegrass (*Poa secunda*) pleated gentian (*Gentiana affinis*)
Plant strategy type / successional stage	No specific information available from the literature but the author estimates this species to be seral, as the species is not particularly fast-growing nor long-lived.[2]
Plant characteristics	Perennial grassland forb with basal rosettes surrounding a long taproot.[3,7] Stems are long with narrowly petiolate leaves and an erect short-branched inflorescence of yellow radiate heads.[7] Genetically and morphologically similar to *Pyrrocoma liatriformis* (*Happlopappus liatriformis*) and grows in the same areas of the Palouse bioregion.[2,4,6] The two species used to both be classified as *P. liatriformis*, and *P. scaberula* was later distinguished as a separate species.[2,4,6] Reproduction is solely from seed; this species does not reproduce vegetatively.[6] Individual plants are not long-lived.[6] Pollinators which visit the species include bumblebees, rove beetles, orange skippers, and small bees and wasps.[6]

PROPAGATION DETAILS

Protocol below is for *Pyrrocoma liatriformis*, a genetically and morphologically-similar species as which *P. scaberula* individuals used to be classified.[2,4,6] Propagation protocols should be extremely similar for the two species.

Below is propagation by seed as explained by Skinner (RNGR)[8], supplemented with other sources as indicated.

Ecotype	Paradise Creek drainage near Pullman, WA
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Container (plug)
Stock Type	10 cu. in.
Time to Grow	Four months
Target Specifications	Root-tight plug in container.
Propagule Collection Instructions	The achene fruits ripen in September and may be collect when pappus begins to expand. Seeds are wind-disseminated and must be collected before blown away by wind. Seeds may be collected with a vacuum, which only removes mature seed as immature seeds are will remain attached to plant and continue to ripen. This method reduces the extent of subsequent seed cleaning. Once harvested, seed may be stored at room temperature in paper bags until cleaned.
Propagule Processing/Propagule Characteristics	For this ecotype, seed density is approximately 357 seeds/g (or 161,740 seeds/lb).
Pre-Planting Propagule Treatments	When cleaning seeds, rub harvested material to free seeds (or thresh with a hammermill if processing large amounts) and clean with an air column separator. To facilitate removal of the pappus, sterile rice hulls may be added to the hammermill. Store cleaned seeds at 40% humidity in 40°F. Seeds will germinate readily without pretreatment. Seeds which have undergone cold moist stratification show no difference in total emergence, although may emerge 1-2 days sooner.
Growing Area Preparation / Annual Practices for Perennial Crops	Sow seeds in January. Fill 10 cu. in. Ray Leach Super cell conetainers with Sunshine #4 soil medium.

Establishment Phase Details	Sow seeds in conetainers and cover lightly, allowing some space in the conetainers for watering. A thin layer of coarse grit may be applied to soil surface to prevent seed movement during watering. Keep soil medium moist until germination. Germination may occur as early as six days and is complete in 18-20 days.
Length of Establishment Phase	Three weeks
Active Growth Phase	Water plants deeply on alternating days and fertilize once a week with a water-soluble complete fertilizer which contains micronutrients.
Length of Active Growth Phase	Three months
Hardening Phase	Move plants to cold frame in late March/early April (depending on weather conditions). Water on alternating days in cool weather and every day in hot, dry weather.
Length of Hardening Phase	Two to four weeks
Harvesting, Storage and Shipping	
Length of Storage	
Guidelines for Outplanting / Performance on Typical Sites	Containerized plants perform best if transplanted in spring.[6] Plants will flower in the spring of the year following transplant.[6] Ideal conditions for flowering include full sun in a mesic environment.[6]
Other Comments	Crown rot can affect the plants and the achenes may be attacked by insect larva. This species is rare and seeds should not be collected.[6]
INFORMATION SOURCES	
References	[1]*Pyrrocoma scaberula Greene Palouse goldenweed* (n.d.).USDA Natural Resources Conservation Service PLANTS database. Retrieved from https://plants.usda.gov/core/profile?symbol=PYSC4 [2]Gray, K., Hill, J., & Mancuso, M. (2005). *Updated Palouse Goldenweed (Pyrrocoma liatriformis) Occurances on BLM Land, Craig Mountain, Idaho*. Conservation Data Center, Idaho Department of Fish and Game. Retrieved from https://fishandgame.idaho.gov/ifwis/idnhp/cdc_pdf/u05gra02.pdf [3]Giblin, D. & McClarin, B. (2017). *Pyrrocoma scaberula*. Burke Museum of Natural History and Culture, University of Washington. Retrieved from http://biology.burke.washington.edu/herbarium/imagecollection.php?SciName

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