Plant Propagation Protocol for *Trifolium willdenovii*
ESRM 412 – Native Plant Production
URL: https://courses.washington.edu/esrm412/protocols/*[year]*/*[USDASpeciesCode.pdf]*
(example: http://courses.washington.edu/esrm412/protocols/2008/LAJA.pdf)

This propagation protocol template was modified by J.D. Bakker from that available at: http://www.nativeplantnetwork.org/network/SampleBlankForm.asp
A completed sample protocol is also provided in Appendix 4A of our text (Wilkinson, K.M., T.D. Landis, D.L. Haase, B.F. Daley, and R.K. Dumroese (editors). 2014. *Tropical nursery manual: a guide to starting and operating a nursery for native and traditional plants*. Agriculture Handbook 732. USDA Forest Service, Washington, DC. 376 p).

TAXONOMY	
Plant Family	
Scientific Name	Fabaceae
Common Name	Pea/Legume Family
Species Scientific Name	
Scientific Name	*Trifolium willdenovii* Spreng. (Syst. Veg. 3: 208. 1826)
Varieties	
Sub-species	
Cultivar	
Common Synonym(s) (include full scientific names,	*Trifolium tridentatum* Lindl. [HC] *Trifolium tridentatum* Lindl. var. *aciculare* (Nutt.) McDermott *Trifolium willdenowii* (orthographical variant)

including variety or subspecies information)	
Common Name(s)	Tomcat clover
Species Code (as per USDA Plants database)	TRWI
Notes	*Trifolium willdenovii* is a relatively easy species to propagate by seed. Prepare seeds by soaking in water for 24 hours, then plant in potting mix or directly in the ground in late winter/early spring. Intolerant of potting media drying out.
GENERAL INFORMATION	
Geographical range (distribution maps for North America and for the Pacific Northwest (generally available at county level for Washington/Oregon)	Tomcat clover is a common annual species that is found throughout southern California and the Channel Islands. Occurring west of the Cascades crest and east along the Columbia River in Washington; British Columbia to California. Baja California (Mexico) through California, western Oregon, and western Washington.
Ecological distribution (ecosystems it occurs in, etc)	*Trifolium willdenovii* is found in grassy slopes, meadows, dry rocky banks, and disturbed areas.
Climate and elevation range	Occurs below 5000 feet.
Local habitat and abundance, commonly associated species	Associated species on Vancouver Island include *Lomatium utriculatum (*foothill desert-parsley), *Myriopteris gracillima* (lace lip fern), *Aspidotis densa* (serpentine fern), *Arbutus menziesii* (Pacific madrona), *Luina hypoleuca* (litteleaf silverback), *Polystichum imbricans* (narrowleaf sword fern), *Calypso bulbosa* (fairy slipper), *Cerastium arvense* (field chickweed), *Sedum spathulifolium* (broad-leaved stonecrop), *Primula hendersonii* (Henderson's shooting star), *Pentagramma triangularis* (goldback fern), *Eriophyllum lanatum* (Oregon sunshine/woolly sunflower), *Sanicula crassicaulis* (Pacific sanicle) Threats to *Trifolium willdenovii* habitat include encroachment from noxious weeds and introduced species such as *Cytisus scoparius (*Scotch broom), *Hypericum perforatum* (St. John's wort), and *Rumex acetosella* (sheep's sorrel); human development

Plant strategy type / successional stage (stress-tolerator, competitor, weedy/colonizer, seral, late successional)	Early seral, weedy/colonizer, stress-tolerator.
Plant characteristics (life form (shrub, grass, forb), longevity, key characteristics, etc.)	Herbaceous annual forb, flowers April-July, 5-infinite flowers per head, involucres >3 mm, involucres often cut less than halfway to base, heads 10-30mm wide, calyx lobes entire or toothed. Leaves: Leaves trifoliate, petioled; leaflets linear to narrowly oblong, 1-4 cm. long, usually serrulate full length; stipules ovate, lacerate, nearly half as long as the leaflets. 3 Flowers: Inflorescence of 6- to 60-flowered, involucrate heads 10-30 mm. flowers 9-18 mm long. Broad and long on axillary peduncles; involucre flared and saucer-shaped, irregularly lacerate into many unequal teeth; calyx often purplish, the tube 15-25 nerved, the 5 teeth lanceolate, equal to the tube; corolla pea-like, purplish, often lighter or darker at the tip, slightly longer than the calyx.
PROPAGATION DETAILS: FROM SEED Catalina Island Conservancy (CIC), Avalon, CA[5]	
Ecotype	Catalina Island, California
Propagation Goal	Plants
Propagation Method	Seed
Product Type	Deepot 40 (40 cubic inch cell) In the 2025-2026 growing season, the Society for Ecological Restoration-UW Native Plant Nursery (Seattle) used 4-inch pots and had success. Plants produced seeds prolifically.
Stock Type	
Time to Grow	4 Months[5]
Target Specifications	Firm root plug in container[5]
Propagule Collection Instructions	Seeds collected from Catalina Island in May and June.[5]
Propagule Processing/Propa	Clover heads dry in paper bags in a warm, dry room. Catalina Island Conservancy (CIC) cleaned the seeds by running material through a 1/4 inch screen or US Standard #5 sieve to release seeds. Product was sifted

gule Characteristics	several times with a Graiman's brand "W" pan (5/64ths) to remove debris. CIC sifted with a #25 pan to remove fine debris. We blow product at 25 setting to remove any remaining debris. After seeds have been cleaned, they are stored under refrigeration in air tight glass containers at 40 F and 40% RH. With 4 collections, seeds average 0.13 grams per 100 seeds.[5]
Pre-Planting Propagule Treatments	Treatment involves a 5-minute 5% bleach solution to surface sterilize seed coats prior to testing or sowing. Next, seeds are scarified seeds by placing them into a 2-hour hot water soak and place them into a 4 week cold, moist stratification at 40F for 4 weeks. Germination percentages have ranged from 29 to 57%. We have had higher germination rates with non-stratified seeds.[5] Society for Ecological Restoration-UW Native Plant Nursery soaked seeds for 24 hours without stratification prior to sowing and had success.[6]
Growing Area Preparation / Annual Practices for Perennial Crops	The James H. Ackerman Native Plant Nursery is located on Catalina Island off the coast of southern California. From 1993 to 2004, the average maximum and minimum temperatures have been 75.4 F and 46 F, with an average of 361 frost free days per year and annual rainfall of 14 inches. The facility is comprised of shade houses, mist propagation house, and an outdoor growing area. All propagation environments are utilized at different stages of seedling growth to provide for the variance in temperature and shading requirements needed during the growing season. CIC irrigates all containers with an overhead emitter system in the shadehouses and use a drip system or hand water in the outdoor nursery.[5]
Establishment Phase Details	Seeds are germinated during late winter and early spring months in a shadehouse were they remain for several weeks. Seeds are directly sown into flats filled with a 1-inch layer of special seed germination mix of 1:1 (v:v) Sunshine Professional Growing Mix and sand on top of 4:1:1 (v:v:v) peat, perlite, and organic compost. We incorporate Osmocote time release fertilizer (9 month release rate) (14 N:14P2O5:14K2O) at the rate of « cup per 0.75 cubic yard of medium. Seeded flats are watered with an overhead emitter system as needed. Seeds germinate 2 to 4 weeks after sowing.[5]
Length of Establishment Phase	1 month[5]
Active Growth Phase	After seedlings are well established and have at least 2 true leaves, they are transplanted into Deepot containers (40 cubic inches)filled with a growing medium of 4:1:1 (v:v:v) peat, perlite, and organic compost. Osmocote time release fertilizer (9 mo release rate) (14

	N:14P2O5:14K2O) is incorporated into the medium at a rate of of « cup per .75 cubic yards of medium. Following transplanting, seedlings are moved to another shadehouse with more temperature variance where they remain for several weeks. Plants are in flower by early May.[5]
Length of Active Growth Phase	3 months[5]
Hardening Phase	No hardening is needed; this is an annual species.[5]
Harvesting, Storage and Shipping	
Length of Storage	
Guidelines for Outplanting / Performance on Typical Sites	
Other Comments	
Not propagated vegetatively	
INFORMATION SOURCES	
References (full citations)	1) Hitchcock, Leo C; Cronquist, Arthur. Flora of the Pacific Northwest Second Edition. 2018. University of Washington Press and Burke Herbarium 2) Turner, Mark; Gustafson, Phyllis. Wildflowers of the Pacific Northwest 3) Burke Herbarium https://www.burkeherbarium.org/imagecollection/taxon.php?Taxon=Trifolium+willdenovii 4) Lady Bird Johnson Wildflower Center. *Trifolium willdenovii*. https://www.wildflower.org/plants/result.php?id_plant=TRWI3 5) Herrera, Mike; Takara, Janet. 2006. Propagation protocol for production of Container (plug) *Trifolium willdenovi* Spreng. plants Deepot 40 (40 cubic inch); Catalina Island Conservancy Avalon, California. In: Native Plant Network. URL: https://NativePlantNetwork.org (accessed 2026/04/28). US Department of Agriculture, Forest Service, National Center for Reforestation, Nurseries, and Genetic Resources. https://npn.rngr.net/npn/propagation/protocols/fabaceae-trifolium-3202/?searchterm=trifolium

	6) Latendresse, Emma. SER-UW Native Plant Nursery 7) Photo by Michelle Watt https://www.inaturalist.org/observations/355915989 8) Calscape https://calscape.org/Trifolium-willdenovii-(Tomcat-Clover)
Other Sources Consulted (but that contained no pertinent information) (full citations)	No info found in Pojar & Mackinnon's Plants of the Pacific Northwest Coast, Cascadia Revealed
Protocol Author	Alexander McLean
Date Protocol Created or Updated	4/28/2026