Garry oak ecosystems recovery team

Annotated Bibliography on the Ecology and Management of Invasive species:

Trifolium dubium
Small Hop-clover

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for the Garry Oak Ecosystems Recovery Team

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Peer-reviewed sources

Caradus, J.R. 1994. Frost tolerance of *Trifolium* species. New Zealand Journal of Agricultural Research 38: 157-162.

Abstract: Thirteen *Trifolium* species were artificially frosted at -4, -8, -12, and -16°C in controlled environment rooms. This was carried out in such a way that soil freezing was avoided and only shoots were frosted. Frost tolerance was primarily assessed as the percentage of dead to total leaf dry weight present 1 week after frosting. *Trifolium arvense, T. dubium,* and *T. hybridum* were the most frost-tolerant, whereas *T. ambiguum, T. subterraneum, T. glomeratum, T. vesiculosum,* and *T. cernuum* were the most frost-sensitive, based on the temperature required to kill 50% of leaves. *Trifolium ambiguum* may have been particularly sensitive to frosting because of its poor vigour (size).

Fenner, M. 1995. The effect of pre-germination chilling on subsequent growth and flowering in three arable weeds. Weed Research 35 (6): 489-493.

Abstract: This experiment investigated the effect of pregermination moist chilling of seeds (for 3 weeks at 2 degrees C) of 10 common arable weeds on the subsequent growth and flowering of the plants. In only three of the species (*Alopecurus myosuroides* Huds., *Veronica persica* Poir. and *Trifolium dubium* Sibth.) was flowering markedly increased by the seed chilling treatments. At 3 months, the mean number of flowers and seed heads per plant on the treated plants was greater than that on the controls by factors of 13.9, 2.02 and 1.74 respectively. Shoot lengths of the seed-chilled plants were also significantly greater in all three species, though dry weights did not differ significantly from those of the controls. Thus, the plants showed morphological changes associated with reproduction but no significant alteration in total dry weight. The ecological implications of the data are discussed in relation to possible effects of climatic change on species which require seed vernalization.

Other sources

Alaback, P., J. Antos, T. Goward, K. Lertzman, A. Mackinnon, J. Pojar, R. Pojar, A. Reed, N. Turner and D. Vitt. 2006. Plants of coastal British Columbia. Pojar, J. and A. Mackinnon (Eds.) B.C. Ministry of Forests and Lone Pine Publishing: Vancouver, BC. p.197.

Baskin, C.C., and J.M. Baskin. 1998. Seeds Ecology, Biogeography, and Evolution of Dormancy and Germination. Academic Press: San Diego, CA. p. 115.

COSEWIC. 2006. COSEWIC assessment and status report on the Coast Microseris (*Microseris bigelovii*). Prepared by M. Fairbarns, A. MacDougall, A. Ceska and O. Ceska. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vi + 26 pp.

Summary:

Common name
Coast microseris
Scientific name
Microseris bigelovii
Status
Endangered
Reason for designation
A small annual herb present in a few fragmented sites within a narrow coastal fringe on southeast Vancouver Island in a densely inhabited urbanized region. Development, recreational activities, site management practices and competition from invasive alien plants continue to impact the species.
Occurrence
British Columbia
Status history
Designated Endangered in April 2006. Assessment based on a new status report.

Douglas, G.W., D. Meidinger and J. Pojar. 1999. Illustrated flora of British Columbia Volume 3 Dicoltyledons (Diapensiaceae through Onagraceae) Ministry of Environment, Lands and Parks and Ministry of Forest. p.164.

Online sources

Agro Atlas. 2009. *Trifolium dubium* Sibth. In: Crops and Wild Relatives. www.agroatlas.ru/en. Interactive Agricultural Ecological Atlas of Russia and Neighbouring Countries, Economic Plants and their Pests, Weeds and Diseases.

Bond, W., G. Davies, R. Turner. October 2007. The biology and non-chemical control of Lesser Trefoil (*Trifolium dubium* Sibth.). www.gardenorganic.org.uk/organicweeds/downloads/trifolium%20dubium.pdf. HDRA, Ryton Organic Gardens, Coventry, UK.

E-flora. 2008. *Trifolium dubium* Sibth. In Klinkenberg, Brian. (Editor) 2010. *E-Flora BC: Electronic Atlas of the Plants of British Columbia* [eflora.bc.ca]. Lab for Advanced Spatial Analysis, Department of Geography, University of British Columbia, Vancouver, BC.

Frame, J. *Trifolium dubium* Sibth. In Grassland Species and Profiles. The Food and Agricultural Organization of the United Nations (FAO).

www.fao.org/ag/AGP/agpc/doc/gbase/Default.htm. Rome, Italy. [Accessed September 7, 2010].

Howtogetridofstuff.com. January 21, 2009. How to get rid of clover. www.howtogetridofstuff.com/odor-removal/how-to-get-rid-of-clover. Howtogetridofstuff.com. Victoria, BC.

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Lindsey, J. *Trifolium dubium*. Ecology of Commanster. www.commanster.eu/commanster.html. [Accessed September 7, 2010].

Natural Resources Conservation Service. *Trifolium dubium* Sibth. Suckling Clover In Plants Database. http://plants.usda.gov/java. United States Department of Agriculture. [Accessed January 19, 2011].

The Royal Horticultural Society. April 22, 2010. Clover in lawns. In: Gardening. www.rhs.org.uk. London, UK.

Texas Invaders. May 12, 2008. *Trifolium dubium* Suckling Clover. In: Invasive Plants. Invasives Database. www.texasinvasives.org. Texas Invasive Plant and Pest Council.

Woods, P. May 21, 2006. *Trifolium dubium*. Stanley Park Explorer. www.stanleyparkexplorer.ca. Interpretive Programs and Design Services. Vancouver, BC.