

DIFFUSE KNAPWEED

Centaurea diffusa Lam.

Family: Asteraceae (Sunflower).

Other Scientific Names: None.

Other Common Names: Spreading knapweed, tumble knapweed.

Legal Status: Provincial Noxious.

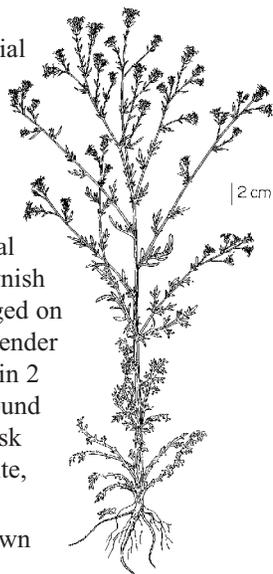


Identification

Growth form: Biennial or short-lived perennial forb.

Flower: Flower heads are broadly urn-shaped, 1.5–2.0 cm tall, solitary or in clusters of 2–3 at the ends of the branches. Floral bracts are yellowish with a brownish margin, sometimes spotted, fringed on the sides, and terminating in a slender bristle or spine. The heads contain 2 types of flowers: ray flowers around the edges surrounding tubular disk flowers. The ray flowers are white, rose-purple, or lavender.

Seeds/Fruit: Seeds are light brown to black.



Leaves: Basal leaves are stalked and divided into narrow, hairy segments. Stem leaves are smaller, alternate, less divided, and stalkless, and become bract-like near the flower clusters.

Stems: Stems are upright, 10–60 cm tall, highly branched, angled, with short, stiff hairs on the angles.

Roots: Taproot.

Seedling: Seedlings have finely divided leaves that are covered with short hairs.



Similar Species

Exotics: Diffuse knapweed may be distinguished from other knapweeds by the terminal spine on the floral bract.

Natives: None.

Impacts

Agricultural: Reduces the productivity of rangeland by displacing desirable forage species for livestock and wildlife.

Ecological: A pioneer species that can quickly invade disturbed plant communities, reduce biological

diversity, and increase soil erosion (Watson and Renney 1974; Sheley et al. 1997).

Human: No information available.

Habitat and Ecology

General requirements: Diffuse knapweed is found on grasslands, shrub lands, and dry open forests at low- to mid-elevations in BC. It occurs in pastures, along roadsides, and on disturbed areas in both rural and urban environments. Diffuse knapweed is not common on cultivated lands or irrigated pasture because it cannot tolerate cultivation or excessive moisture (Watson and Renney 1974).

Distribution: Diffuse knapweed is distributed throughout southern BC east of the Coast-Cascade

mountains. It is considered a major concern in the Kootenay, Okanagan, Thompson, Cariboo, Omineca, and Peace River agricultural reporting regions. Pockets also occur in the Chilcotin (Powell et al. 1994). The plant is widely spread throughout the northwestern US.

Historical: Introduced from Eurasia.

Life cycle: Diffuse knapweed is usually regarded as a biennial, although some plants may remain as rosettes for several years, depending on environmental conditions (Thompson and Stout 1991). Flower buds

are usually formed in early June, flowering occurs in July, and seeds are formed by mid-August (Watson and Renney 1974).

Mode of reproduction: By seed.

Seed production: A single diffuse knapweed plant can produce up to 18,000 seeds (Harris and Cranston 1979), and a stand of diffuse knapweed can produce up to 40,000 seeds/m² (Watson and Renney 1974).

Seed bank: Seeds may remain dormant in the seed bank for many years.

Management

Biocontrol: Ten biological control agents have been released on diffuse knapweed in the province: *Agapeta zoegana* (moth), *Chaetorellia acrolophi* (fly), *Larinus minutus* (weevil), *Larinus obtusus* (weevil), *Pelochrista medullana* (moth), *Pterolonche inspersa* (moth), *Puccinia jaceae* (stem and leaf rust), *Sphenoptera jugoslavica* (beetle), *Urophora affinis* (fly), and *Urophora quadrifasciata* (fly) (Powell et al. 1994). In addition, *Cyphocleonus achates* (weevil) has successfully moved onto diffuse knapweed in some habitats.

Mechanical: Cutting or mowing before seed-set can be effective to reduce seed production, but it will not eliminate large infestations. Cut plants and rosettes may survive and re-bolt. Ideally, mowings should be followed by an autumn herbicide treatment (Sebastian and Beck 1999). Hand-pulling can be effective on small infestations, but it often needs to be repeated, depending on the size of the initial weed population.

Fire: The direct effects of fire to control diffuse knapweed have been conflicting. One study reported that neither spring nor autumn burning reduced knapweed populations on 2 grassland sites near Vernon (Nicholson 1992). In another study, Zimmerman (1997) reported that fire effectively controlled diffuse knapweed, and a vigorous stand of grasses occupied the burned sites. Under some circumstances, fire can be used to remove standing dead material, which may increase the efficacy of herbicides applied after the burn (Roche and Roche 1999).

Herbicides: Several herbicides are effective to control diffuse knapweed. Picloram is the most widely

Dispersal: Seeds are distributed around the parent plant when plants sway in the wind, but mature plants often break at the stem and become tumbleweeds, allowing seeds to disperse over great distances (Watson and Renney 1974; Zimmerman 1997). Livestock, wildlife, and humans also readily disperse the plant.

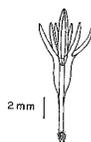
Hybridization: No information available.

recommended (Harris and Cranston 1979). Other herbicides, such as clopyralid, dicamba, 2,4-D, and glyphosate, are also effective (Beck 1997; Youtie 1997; Watson and Renney 1974). To maximize effectiveness, herbicides should be applied before plants set seed, or to rosettes in the autumn. Consult the most recent edition of BC Ministry of Agriculture, Food and Fisheries Crop Production Guides for specific recommendations. **Before applying herbicides read the label for full use and precautionary instructions.**

Cultural/Preventive: Prevent establishment by managing to minimize disturbance. Clean machinery, vehicles, and equipment. Manage grazing or other land use to maintain vigorous native communities.

Integrated Management Summary

The most effective management method for diffuse knapweed is to prevent establishment. Small infestations should be dealt with immediately by hand-pulling the plants, herbicide application, or both. Seed disturbed sites immediately to prevent further infestation. Follow-up is essential to ensure that the initial treatment was effective. On sites too large for these methods to be effective, biocontrol should be considered.



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