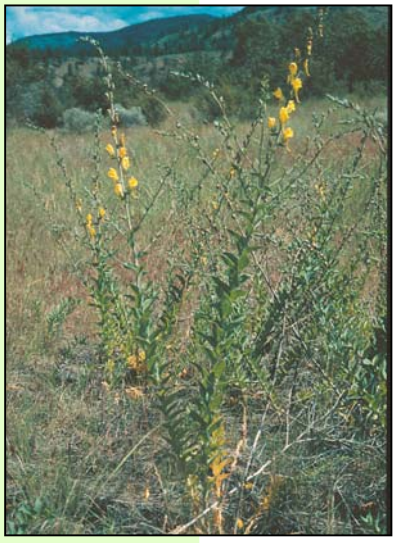
DALMATIAN TOADFLAX (*Linaria genistifolia* ssp. *dalmatica* L.)

INTRODUCTION

Dalmatian toadflax, also known as broad-leaved toadflax, is native to the Mediterranean regions of Europe and western Asia. In BC, this escaped ornamental plant occurs most frequently in the Southern Interior invading open, low-elevation, coniferous forests and adjacent shrub-steppe habitat. It is most commonly found on sandy or gravely soil on roadsides, railroads, pastures, cultivated fields, rangelands and clear cuts. While toadflax can rapidly colonize disturbed or cultivated ground, plants can also invade healthy native plant communities.

A persistent and aggressive invader, Dalmatian toadflax has expanded significantly in the western United States and western Canada during the last few decades. Toadflax displaces native vegetation, thereby altering the species composition of natural communities. It is a strong competitor, quickly colonizing open sites, and adapting to a wide range of environmental conditions. Once Dalmatian toadflax becomes established, it is particularly competitive with winter annuals and shallow-rooted perennials.

While some researchers claim that Dalmatian toadflax is toxic to livestock when consumed in significant amounts, reports of livestock poisonings are rare. Deer reportedly graze prostrate shoots in fall, winter, and early spring, and horses are suspected of feeding on mature plants. Dispersal probably occurs as seed pass through the gut or are caught in the hair of these animals, as well as by birds and water.



IDENTIFICATION

- Member of the figwort family
- Creeping-rooted perennial
- Grows from 0.5 to 1.2 m tall
- Bright yellow “snapdragon-like” flowers
- Leaves are waxy, light green and heart-shaped

Similar species - Yellow toadflax (L. vulgaris) grows only to 0.6 m tall and has leaves that are long, narrow and pointed at both ends. The flowers also have an orange spot on the lower lip.

BIOLOGY

Dalmatian toadflax reproduces by seed and vegetative propagation. Individual plants live up to five years with an average lifespan of 3.8 years. Live span depends on environmental conditions and the reproductive success of individual plants.

Toadflax plants begin emerging in the spring about mid-April, depending on temperature. Flowering occurs from May-August and seeds mature from July-October.

A mature plant can produce up to 500,000 seeds annually, and they can remain viable for up to ten years. Prostrate stems emerge in September; they are tolerant of freezing and are associated with floral stem production the following year.

Root buds can form on fragments as short as 1 cm in length and as early as 2-3 weeks after germination. These buds can grow their own root and shoot systems, and become independent plants the next year.

INTEGRATED MANAGEMENT

The best overall method of control for Dalmatian toadflax is an integrated program. Management should focus on impeding vegetative spread and reducing seed production. This includes minimizing soil disturbances and re-vegetating exposed areas to provide competition. Hand-pulling or killing plants with herbicide before seed production, with regular follow up, can be effective on new and small infestations. For large infestations, biological control should be utilized.

Management techniques should be conducted in June. This is when root carbohydrate reserves are at their lowest, which makes it more difficult for the plant to recover from disturbance. Follow-up work in late June or early July is recommended to locate and remove any late-flowering plants.

PREVENTION

- Learn to identify Dalmatian toadflax and other invasive plants.
- Maintain your land in a healthy, vigorous condition to ensure a productive plant community; competitive perennial grasses and forbs utilize water and nutrients that would otherwise be readily available to toadflax.
- Regularly patrol your property for Dalmatian toadflax plants and immediately treat new infestations.
- Cooperate with adjacent landowners and encourage them to control Dalmatian toadflax.
- Immediately re-vegetate disturbed, bare soils with a suitable seed mix that provides dense, early colonization to prevent weed invasion.
- Clean your vehicles and machinery of plant material and soil before leaving a toadflax infestation.
- Follow a well-designed grazing plan; excessive livestock grazing reduces competition and favours weeds.

PHYSICAL CONTROL

Individual plants and small patches of Dalmatian toadflax can be hand-pulled or hand-cut to prevent seed formation. Hand pulling is most successful where soils are sandy and/or moist, allowing for removal of as much root as possible. Hand-cutting toadflax stands to ground level in spring or early summer is an effective way to eliminate seed production and dispersal, but it will not destroy plants. Mechanical mowing might even be less effective on toadflax than cutting because it leaves several centimetres of stem above the soil surface that may allow plants to re-sprout more rapidly. Physical removal must be repeated annually for at least ten years to completely deplete the seed bank.

For further information on weeds in BC check out the websites: http://www.weedsbc.ca For more information about the Regional District of Okanagan-Similkameen Noxious Weed Education Program please contact the Regional District at 250-492-0237 or toll free at 1-877-610-3737. Information is also available on our website at: http://www.rdos.bc.ca

BIOLOGICAL CONTROL

Several biological control agents have been released in BC, the most successful being a black, stem-boring weevil, *Mecinus janthinus*. Adults of this bioagent feed on new shoots and create “shot holes” in the leaves, while larva feed from within the plant, damaging the internal growth tissues. In recent years, notable reductions have been observed in populations of Dalmatian toadflax throughout the Okanagan Valley as a direct result of attack by *M. janthinus*. Another agent that also feeds on toadflax leaves is *Calophasia lunula*, a pale to dark brown moth with white markings. It is most easily distinguished during its larval phase, when it is pearl-coloured with five yellow stripes along the back and sides. A new bioagent, *Gymnaetron antirrhini*, has recently been released in the Okanagan. This weevil feeds on seed capsules later in the summer, and may prove to be an excellent addition to *Mecinus* to improve control.

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