

*Dalmatian Toadflax**(Linaria dalmatica ssp. dalmatica)***Description:**

Dalmatian toadflax is an erect, short-lived perennial herb growing 3 feet tall or more. The plant is hairless, growing from a woody branching base. Light green waxy leaves are heart shaped and clasp the stem. Flowers are located on the upper leaves and bracts, and are yellow with an orange bearded throat. A mature plant may produce 500,000 seeds per year. Dalmatian toadflax flowers from May to August. Wind and animals disseminate seeds. The plants can also reproduce by creeping rootstocks that are deep and extensive, contributing to the infestation's spread. The root system may be as deep as six feet and may spread laterally as much as ten feet. Prostrate vegetative stems also develop adventitiously from the crown and roots of the seedling. They will persist over winter and then die when flowers begin to develop the following season. Dalmatian toadflax was introduced to the United States as an ornamental species because of its showy snapdragon type flowers.

**Impacts:**

Dalmatian toadflax crowds out valuable forage and has no value as forage. Studies indicate that plots without toadflax yield 2.5 times more grass production than plots with toadflax. Toadflax is a concern in pastures and natural areas, where it may out-compete more desirable native species. Although cattle avoid grazing this plant, Dalmatian toadflax contains a poisonous glucoside harmful to cattle if consumed in large quantities.

Control Options:

Thurston County's Integrated Pest Management emphasizes cultural, biological, and manual control methods to keep pests and vegetation problems low enough to prevent damage. The goal of Thurston County's pesticide use policy is to minimize the use of pesticides by utilizing and providing information about the most effective control options that are available and practical.

► Cultural/Habitat

Preventing the establishment of populations of Dalmatian toadflax is the most time and cost effective way of controlling this species. Farm, rangeland, and outdoor recreation equipment can transport seeds, and should be cleaned thoroughly before moving from infested areas to un-infested areas. Livestock can also transport seeds. Also, be careful using wildflower seed mixtures. Noxious weed seeds are a frequent contaminant.

**► Manual**

Evaluation of Dalmatian toadflax infestation sites indicates a 44.6 percent control effectiveness rate using manual control. This includes digging and removing as much of the root as possible, followed by reseeding disturbed areas and using barrier cloth to prevent germination. Plants are easiest to control in the seedling stage, and when found should be removed immediately. Pulling small infestations before they become established, can be an effective control method, especially if growing in sandy or moist soil.

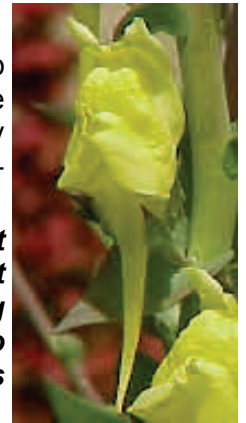
► Biological

While there are effective biocontrol agents that are used in some parts of the country, there are currently no known agents for use in Western Washington.

► Chemical

Spot spraying an herbicide containing the active ingredient [glyphosate](#) (example: Roundup Pro®, Glyphos®, etc.) can be effective in controlling Dalmatian toadflax. Currently, glyphosate is the only herbicide for the control of Dalmatian toadflax considered “low in hazard” by Thurston County’s pesticide review process for the potential for chemical mobility and persistence.

Thurston County has observed that most ready-to-use, pre-mixed products do not contain sufficient active ingredients to be as effective as concentrated products that are then mixed with water to create a specific finished concentration. The following instructions are for products containing 41% glyphosate which will be mixed down to a specified dilution rate. Be sure to read your label carefully, and make adjustments to rates accordingly.



The Roundup Pro® label recommends mixing a 1–2% solution for hand-held or spot applications for control of perennial weeds, the rate depending on size, species and conditions. Because of the extensive root system and waxy coating on the leaves and stems, the higher (2%) solution is the most appropriate. Spraying with a lower percentage solution may not kill the plants, which can contribute to herbicide resistance.

Foliar applications of *glyphosate* (ROUNDUP PRO™):

- Using a spot application, spray each plant thoroughly on the stems and leaves, enough to be wet but not dripping. Spot application means the herbicide is applied only to the Dalmatian toadflax plants, and not on the surrounding plants or soil. A .75% glyphosate solution (after mixing for use) is necessary to control Dalmatian toadflax. Follow label directions for mixing product to application strength.
- Glyphosate is non-selective, and will injure any plants that it comes in contact with, including grass.
- Keep people and pets off treated areas until spray solution has dried.

To 1 gallon of water add:	2.66 oz. Roundup Pro® (for a 2% product spray solution)
1 fluid ounce = 2 Tablespoon	

Products containing the active ingredient *imazapyr* (**Habitat® and Arsenal®**), are considered “moderate in hazard” by Thurston County’s pesticide review process for the potential for chemical mobility and persistence and are a second choice for chemical control.

Foliar applications of *imazapyr* (Habitat®), (Arsenal®)

- Licensed applicators are required to use this product
- Spot applications with *imazapyr* products are effective.
- Imazapyr is non-selective, and will injure any plants that it comes in contact with, including grass.
- Keep people and pets off treated areas until spray solution has dried.
- Do not use on lawns walks driveways or similar areas where roots of desirable vegetation may extend and be exposed to potential injury.

Timing: Spot applications should be applied at early bloom stage and if necessary, again in late fall for persistent infestations. In Western Washington, Dalmatian toadflax usually begins blooming in May or June. For most effective treatments, apply before plants produce seed.

READ AND FOLLOW ALL LABEL DIRECTIONS AND RESTRICTIONS. Use of brand names does not imply endorsement and is for reference only; other formulations of the same herbicides may be available under other names. Information provided is current as of the date of the fact sheet. Pesticide product registration is renewed annually and product names and formulations may vary from year to year.

REFERENCES:

Written Findings of the Washington State Noxious Weed Control Board, http://www.nwcb.wa.gov/weed_info/written_findings/CLASS%20B%20PDFs/Linaria%20dalmatica%201997.pdf

Oregon State University Extension Bulletin, PNW 135, Yellow Toadflax and Dalmatian Toadflax, M.D. Butler and L.C. Burrill

North Dakota Department of Agriculture Noxious Weed Bulletin, <http://www.agdepartment.com/NoxiousWeeds/pdf/DALMATIANTOADFLAX.pdf>



Thurston County Public Health & Social Services
2000 Lakeridge Drive SW
Olympia WA 98502
Phone: 360-754-4111
T.D.D. 360-754-2933
www.co.thurston.wa.us

Thurston County Noxious Weed Control
11834 Tilley Road S.
Olympia, WA 9812
Phone: 360-786-5576
T.D.D. 360-754-2933
tcweeds@co.thurston.wa.us