



Yellow Toadflax and Dalmatian Toadflax

Linaria vulgaris Hill and *Linaria dalmatica* [L.] Mill.

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Yellow toadflax (*Linaria vulgaris*) and Dalmatian toadflax (*Linaria dalmatica*) are members of the figwort (Scrophulariaceae) family. They were introduced into North America as ornamental plants because of their showy, snapdragon-like flowers.

Yellow toadflax was brought from Wales in the mid-1800s as a garden flower by Ranstead, a Welsh Quaker who came to Delaware with William Penn. It flourished in his garden and soon was cultivated in other flower gardens. Dalmatian toadflax is a native of southeastern Europe introduced around 1900.

Yellow toadflax is more common throughout eastern North America but also is scattered throughout the western United States. Dalmatian toadflax is most common east of the Cascade Mountains and is found locally throughout much of the range country in the western United States.

Both species can be found in fields, overgrazed pastures, rangeland, waste areas, and along roadsides (Figure 1). Their wide distribution can be attributed to their use as ornamentals.



Figure 1.—A typical setting where Dalmatian toadflax invades.



Figure 2.—Flowers of Dalmatian toadflax. Note the long spurs.



Figure 3.—Flowers of yellow toadflax are similar to those of Dalmatian toadflax.

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There are about 130 species of *Linaria*, a genus of hardy herbs native to Eurasia. The generic name *Linaria*, derived from the Latin *linon* or *linum*, means flax. (True flax is *Linum usitatissimum* L.) Many weedy species of *Linaria* resemble flax in leaf shape and arrangement.

In the Middle Ages, yellow toadflax was called wild snapdragon because of its close resemblance to the garden snapdragon, *Antirrhinum majus* L., whose generic name means dragon mouth.

In Germany, yellow toadflax was used as a yellow dye for centuries. Immigrants, especially the Mennonites, soon

began cultivating yellow toadflax for dyeing their homespun apparel.

Although they are not found in extremely large numbers, yellow toadflax and Dalmatian toadflax can present serious localized problems because of their growth habits and potential to spread. Both are aggressive perennials with extensive, deep root systems.

They reproduce both by horizontal or creeping rootstocks and by seed. They are capable of producing large numbers of seed; a mature Dalmatian toadflax plant can produce up to 500,000 seeds per year, which are spread by wind and animals and can remain dormant in the soil for up to 10 years.

Neither species is considered poisonous, but yellow toadflax is reported to contain a poisonous glucoside that may be harmful to livestock. Since both

yellow toadflax and Dalmatian toadflax are unpalatable, reports of livestock poisoning are rare.

Identification and Biology

Dalmatian toadflax is an attractive plant with erect stems up to 3 feet tall, while yellow toadflax has erect smooth stems that are rarely more than 2 feet tall. Dalmatian toadflax is more robust than yellow toadflax, with increased branching near the top of the plant.

Leaves of both species are alternate, but may appear to be opposite because of their crowded condition. The egg-shaped leaves of Dalmatian toadflax are pointed and clasp the stem, while the leaves of yellow toadflax are long, narrow, and pointed at both ends.

Flowers of Dalmatian toadflax are borne in the axils of the upper leaves and bracts. They are two-lipped, $\frac{3}{4}$ to $1\frac{1}{2}$ inches



Figure 4.—Dalmatian toadflax.

Use herbicides safely!

- **Wear** protective clothing and safety devices as recommended on the label. **Bathe or shower** after each use.
 - **Read** the herbicide label—even if you've used the herbicide before. **Follow closely** the instructions on the label (and any other directions you have).
 - **Be cautious** when you apply herbicides. **Know** your legal responsibility as an herbicide applicator. You may be liable for injury or damage resulting from herbicide use.
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long, yellow with an orange bearded throat, and a long straight or somewhat curved spur (Figure 2).

Flowers of yellow toadflax appear as dense terminal clusters that gradually elongate, with new flowers forming above as fruit matures below. The flowers are 1 inch or more long, spurred, and yellow with an orange bearded throat (Figure 3). Their color has led to the common name "butter-and-eggs."

Dalmatian toadflax flowers from May to August, while yellow toadflax blooms from June through September.

Seed of both species is formed in two-celled capsules, with Dalmatian toadflax seed being sharply angular and slightly winged (Figure 4). Yellow toadflax seeds are flattened with a papery circular wing, enabling them to be disseminated readily by the wind (Figure 5).

Yellow toadflax tends to grow in crowded patches (Figure 6), while Dalmatian toadflax is usually more scattered, even though some plants are connected underground (Figure 7).

Control

Prevention

Although a single plant may have little impact in non-crop areas or on crop yield, the potential for loss from future infestations that develop from the extensive root system or seed can be disastrous.

Preventive weed control measures include the following:

- Learn to identify yellow toadflax and Dalmatian toadflax seedlings

- Prevent yellow toadflax and Dalmatian toadflax plants from producing seed
- Avoid bringing roots or seed into uninfested fields on equipment or manure

Cultural control

Both Dalmatian toadflax and yellow toadflax can be controlled by intensive clean cultivation. Begin cultivation early in June and repeat as needed so that there are never more than 7 to 10 days with green growth visible. Sweep-type cultivators provide the best result. Continue cultivation for at least 2 years, with 8 to 10 cultivations the first year and 4 to 5 cultivations the second year.

Seedlings of Dalmatian and yellow toadflax do not compete well for soil moisture against established perennial and winter annual crops. Therefore, it is worthwhile concentrating resources on establishing and managing desirable grasses that will compete with weeds or

prevent them from becoming established.

Chemical control

Studies of herbicide application for perennial weed control indicate the best time for application is when carbohydrate reserves in the underground portions are lowest. Reserve carbohydrates of Dalmatian toadflax are at their highest levels in the fall at the end of the growing season, and at their lowest point at the beginning of flowering in May (Dalmatian toadflax) or June (yellow toadflax).

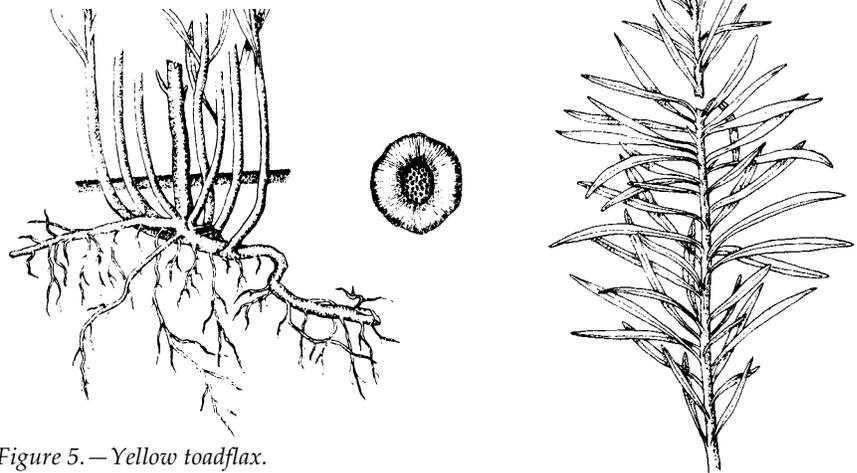


Figure 5.—Yellow toadflax.



Figure 6.—Yellow toadflax tends to grow in tight clumps.

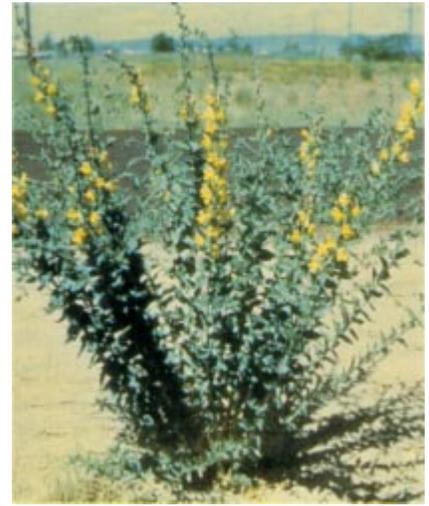


Figure 7.—An individual mature Dalmatian toadflax plant.

Since herbicide registrations change frequently, resulting in more or fewer available herbicides and changes in permissible herbicide practices, this publication doesn't make specific herbicide recommendations. For current information, refer to the *Pacific Northwest Weed Control Handbook*, published and revised annually by

the Extension Services of Oregon State University, Washington State University, and the University of Idaho.

In addition, detailed instructions for herbicide use are provided on herbicide container labels and in other literature provided by herbicide manufacturers.

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