

WATCH OUT *for* Toadflax

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Invasive weeds are non-native plants that invade ecosystems and replace native plants. Noxious weeds are usually invasive and designated by State law as priority plants that require control by landowners. These weeds can reduce grazing land and impact wildlife habitat. Early detection and quick response is critical to slow spread and protect weed-free areas. The purpose of this bulletin is to provide early control methods for Dalmatian and yellow toadflax (*Linaria dalmatica* and *L. vulgaris*). Contact your county weed coordinator or Extension agent for management of large infestations.

Dalmatian and yellow toadflax (Figwort Family) are natives of the Mediterranean region. They were introduced to North America as ornamentals and folk remedies. These weeds are rhizomatous, perennial forbs with bright yellow snapdragon-shaped flowers. Mature Dalmatian toadflax plants have 1 to 25 erect floral stems and grow 2 to 3 feet or taller. Leaves and stems are waxy with a whitish to bluish shade of green. Heart-shaped leaves are alternate and clasp around somewhat woody stems. Mature yellow toadflax plants are 1 to 3 feet tall. Leaves are narrow, lance-shaped and alternate on the stem. Stems and leaves are pale green in color.

Habitat

Dalmatian toadflax can adapt to a wide range of environmental conditions. It is most commonly found in rangelands, clear cuts, pastures, waste areas, and along roadsides and fences. Toadflax favors disturbed ground, but it frequently occurs in excellent condition rangeland. Established toadflax is an intense competitor for limited soil resources. Vegetative shoots are not dependent on soil moisture and resist competition from native plants. Native plant community condition, therefore, may be ineffective in slowing Dalmatian toadflax expansion. It is important to locate new invasions early.

Biology and spread

Toadflax reproduces by vegetative shoots and seeds. Dalmatian and yellow toadflax can produce up to 500,000 and 30,000 seeds per plant, respectively. Seeds initiate new invasions and can remain dormant in the soil at least 10 years. Vegetative reproduction from root buds allow spread in closed grasslands even without seed production. Yellow toadflax colonies expand mostly through vegetative reproduction rather than by seed, while Dalmatian toadflax expands by both seed and vegetative spread. Seeds are dispersed by wildlife, livestock, vehicles and construction equipment. Seeds are also spread to new sites in mud on boots and impure materials like mulch, forage and feed grains, crop and grass seed, top soil, and gravel.



Dalmatian toadflax prefers dry sites with coarse, well-drained soils. Flowers are bright yellow with elongated spurs and occur in simple racemes on the stems.



Photo by S. Turner (BCMP)

Photo by M. Tiu (TNC)

Early control methods

Young, individual plants can be dug up or hand-pulled before an extensive root system develops. Small patches should be eradicated with an appropriate herbicide during the rosette/seedling stage or the early bud/pre-bloom stage, depending on environmental conditions. Herbicide absorption is enhanced with early bud/pre-bloom and fall re-growth treatments when shoot to root translocation is the greatest. Eradication requires that reproduction is stopped completely to prevent reinvasion.

Herbicide selection and timing should be advised by your county weed coordinator and application must follow label directions. Applications of 2,4-D alone are not very effective. Roots may rapidly sprout new growth and repeated applications are usually required. But this herbicide may be the only cost-effective choice near water. Effective herbicide treatments on sites distant from surface or ground water follow. Include surfactants to improve herbicide performance.

- Metsulfuron (Escort®) applied at a rate of 1½ to 2 ounces/acre plus 2,4-D at a rate of 1 quart/acre.
- Chlorsulfuron (Telar®) applied at a rate of 1 to 2 ounces/acre plus 2,4-D at a rate of 1 quart/acre.
- Imazapic (Plateau®) applied at a rate of 8 to 12 ounces/acre. This exact rate should be followed to prevent damage to native plants. Contact your county weed coordinator for assistance and product availability.
- Picloram (Tordon®) applied at a rate of 2 to 4 pints/acre plus 2,4-D at a rate of 2 quarts/acre.

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Yellow toadflax flowers occur in clusters on each stem.

Photo by M. Shephard (USFS)



Yellow toadflax prefers disturbed areas, but it can also invade a variety of largely undisturbed habitats when site conditions are right.

Photo by D. Powell (USFS)

Prevent toadflax spread and colonization by locating and eradicating new plants and patches. The key to eradication is 100% control to prevent reinvasion and eliminate root reserves. Prevent invasion by using weed-free mulch, forage and feed grains, crop and grass seed, top soil, and gravel. Monitor sites for new weeds where at-risk material was used. Revegetate disturbed areas with native grasses and maintain healthy and competitive native plant communities. Encourage outdoor users to clean equipment, remain on trails, and report new invasions.