BIOCONTROL OF DALMATIAN TOADFLAX

DALMATIAN TOADFLAX STEM MINING WEEVIL

MECINUS JANTHINIFORMIS


a.


b.


c.

DALMATIAN TOADFLAX (*LINARIA DALMATICA*) PLANT GUIDE

Life Cycle	Root	Leaves	Stems	Flower	Seed/Fruit
Perennial	Taproot and horizontal roots	Waxy, pale green to bluish-green, heart-shaped to oval, alternate with smooth edges, that clasp the stem.	Up to 3 feet tall, robust, waxy	Bright yellow snapdragon-shape with an orange throat and a long spur, occur in spiked clusters	Irregular angled seeds in two-celled capsule

BIOCONTROL AGENT DESCRIPTION

- Larvae are around 5mm (1/4in) long, white with brown head capsules
- Adults are 3-6mm (1/4in) long, elongated with long snouts, and bluish black in color

MONITORING

- From spring to mid-summer, visually check for adults near the stem or sweep net the plants
- Later in summer to the following early spring, stems can be dissected to look for larval feeding damage, larvae, pupae, new adults, or their dry and powdery, sawdust-like excrement

BIOCONTROL AGENT IMPACT

- Larval feeding within the stem damages tissue and reduces water/nutrient transport with dehydration killing some stems
- Larval stem mining may cause upper portions of the stem to become deformed
- Adult feeding stunts shoots and roots, and reduces flowering and seed production

LIFE CYCLE	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
DALMATIAN TOADFLAX	Overwintering		Rosette		Bolting	Flowering		Seeding		Overwintering Stem		
STEM MINING WEEVIL	Overwintering Adults								Overwintering Adults			
				Adults								
					Eggs							
					Larvae							
						Pupae						

How to Use

- Release 200+ weevils during late spring to early summer in warm, dry, open-canopy areas in a minimum of 1 acre infestation of Dalmatian toadflax (infestations of 5 or more acres are preferable)
- If the infestation is present on hillsides, it is best to release the weevils at the bottom or lower sections of the hill
- They survive winter best in areas where snow is deep enough to cover and insulate at least the bottom half of the stems
- Avoid releasing in areas subject to heavy livestock or wildlife feeding or other significant disturbance

Note

- *Mecinus janthiniformis* (specific to Dalmatian toadflax) and *Mecinus janthinus* (specific to yellow toadflax) look similar, but they will only attack the toadflax that they are specific to
- Be sure that you are releasing the correct *Mecinus* species on the toadflax species it was collected from
- *Mecinus janthiniformis* (Dalmatian toadflax) tends to be larger than *Mecinus janthinus* (yellow toadflax)

In Montana

- Population buildup of these insects has been more rapid west of the Continental Divide where the winters are mild and snow cover typically provides adequate insulation for overwintering adults
- Success has been more variable east of the Divide

d.

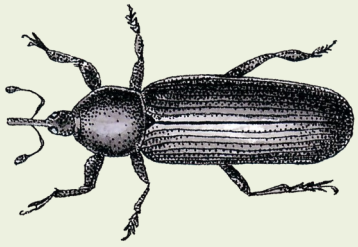

Image Key

a. Dalmatian toadflax typical plant (Eric Coombs, Oregon Department of Agriculture, Bugwood.org)

b. Dalmatian toadflax close-up of leaves (Linda Wilson, University of Idaho, Bugwood.org)

c. Dalmatian toadflax stem mining weevil (Laura Parsons, University of Idaho, PSES, Bugwood.org)

d. Adult Dalmatian toadflax stem mining weevil illustration (not to scale)

e. Dalmatian toadflax stem with adult stem mining weevils

f. Dalmatian toadflax stem with stem mining weevil larva

g. Dalmatian toadflax seasonal changes; bolting in spring (left), mature flowers in summer (center), seeding in fall (right)

Illustration Credit: **d**–**g.** Evelyn Neel, www.evelynneel.com

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