BIOCONTROL OF YELLOW TOADFLAX

YELLOW TOADFLAX STEM MINING WEEVIL

MECINUS JANTHINUS


a.


b.


c.

YELLOW TOADFLAX (*LINARIA VULGARIS*) PLANT GUIDE

Life Cycle	Root	Leaves	Stems	Flower	Seed/Fruit
Perennial	Creeping rhizomes	Numerous, alternate, pale-green to gray-green, 2½ inches or longer, narrow, pointed at both ends, with smooth edges	8 to 24 inches tall, usually not branched	Yellow, snapdragon-like flowers often with orange center, 1 to 1¼ inch long with 1 inch long spur, dense clusters at top of stems	Seeds dark brown to black, less than 1/10 inch diameter, flattened, with papery circular wing, round to oval capsule with two compartments

BIOCONTROL AGENT DESCRIPTION

- Larvae are up to 5mm (1/4in) long, white with brown head capsules
- Adults are 2.4-3.4mm (1/8in) long, elongated with long snouts, and bluish black

BIOCONTROL AGENT IMPACT

- Larval stem mining causes severed water/nutrient transportation that stunts plant growth and may cause upper portions of the stem to be deformed
- When present in high numbers, adult feeding damages the growing tips of the stems, reducing flowering and seed production

MONITORING

- In early spring, check along the upper portion of the stems for adults
- The leaves of infested stems are often whorled and yellow, with an overall appearance similar to plants with herbicide damage
- During summer, dissect stems and look for larval feeding damage (tunneling), larvae, pupae, new adults, or dry and powdery, sawdust-like excrement

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

How to Use

- Release 200+ weevils during late spring in warm, dry open canopy areas in a minimum of 1 acre infestation (infestations of 5 or more acres are preferable)
- Weevils survive winter best in areas where snow is deep enough to cover and insulate stems
- Stem mining weevils have a difficult time establishing if the area is heavily grazed or disturbed
- This agent spreads very effectively on its own resulting in established populations where no known releases have been made
- Surveying yellow toadflax infestations for the stem mining weevil prior to making additional releases of this agent is recommended

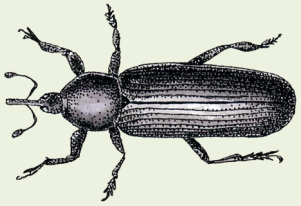
Note

- *Mecinus janthinus* (specific to yellow toadflax) and *Mecinus janthiniformis* (specific to Dalmatian 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 janthinus* (yellow toadflax) tends to be smaller than *Mecinus janthiniformis* (Dalmatian toadflax)

In Montana

- Establishment and build-up of *Mecinus janthinus* to impactful numbers is linked to variability in environmental conditions from site-to-site and year-to-year, such as reduced or extended seasonal snow cover and either extreme fluctuations in or extended periods of low ambient temperature

d.



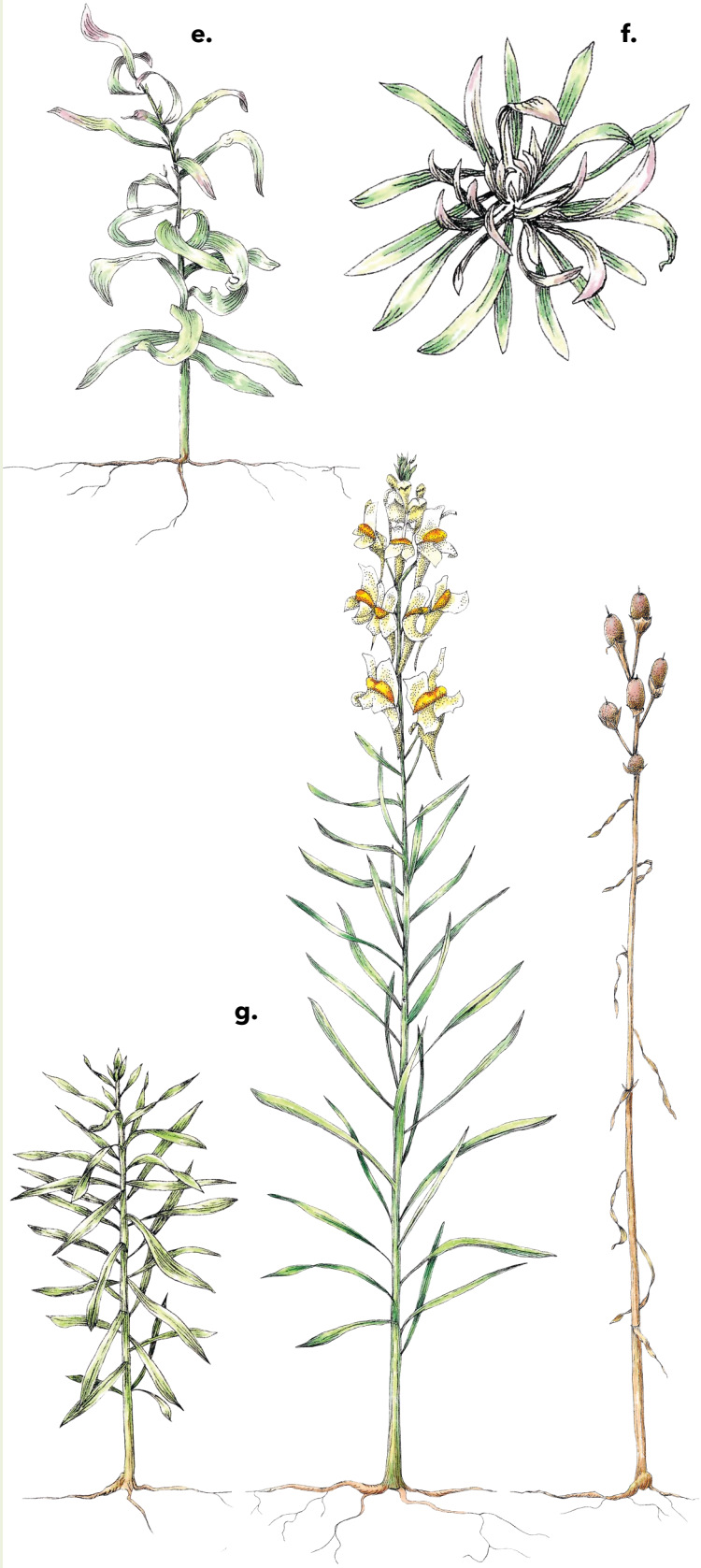


Image Key

a. Yellow toadflax flowerhead (Michael Shephard, USDA Forest Service, Bugwood.org)

b. Yellow toadflax infestation (Bob Nowierski, Montana State University, Bugwood.org)

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

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

e. Yellow toadflax stem mining weevil damage (side view)

f. Yellow toadflax stem mining weevil damage (view from top)

g. Yellow 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

1075 South Ave West, Suite 1 | Missoula, MT 59801
406.258.4223 | www.mtbiocontrol.org

Montana Biocontrol Coordination Project