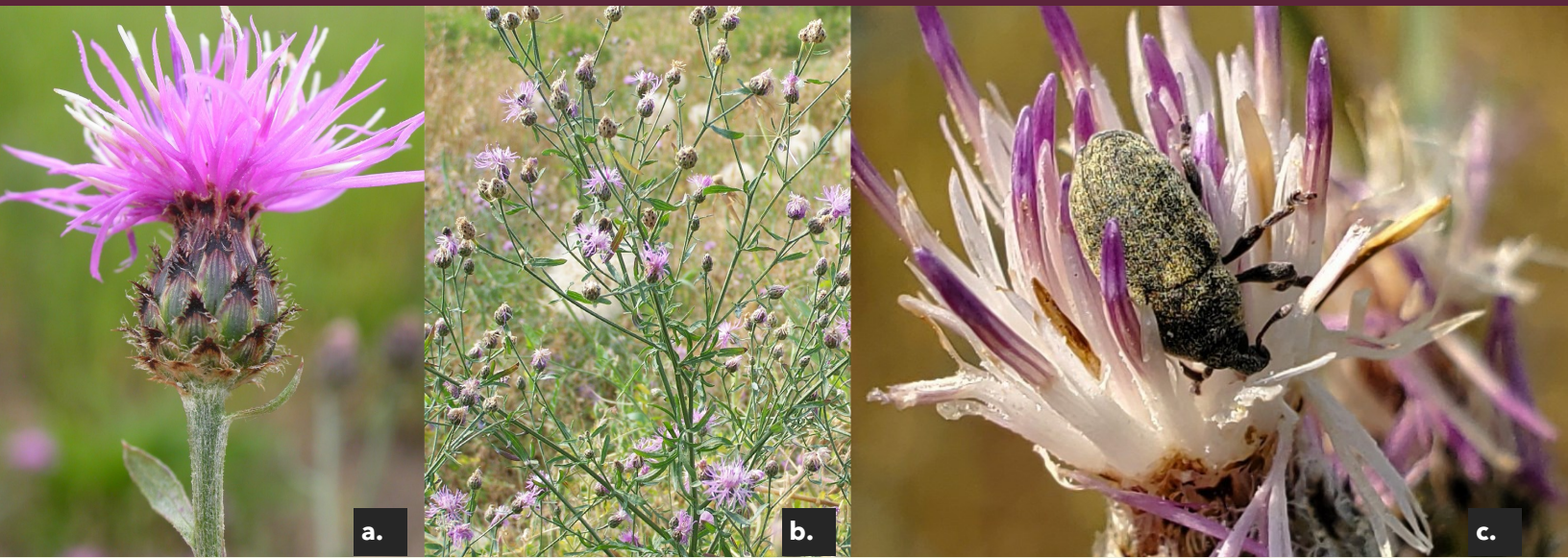


# BIOCONTROL OF SPOTTED KNAPWEED

## KNAPWEED FLOWER WEEVILS

LARINUS SPP.



### SPOTTED KNAPWEED (*CENTAUREA STOEBE*) PLANT GUIDE

Life Cycle	Root	Leaves	Stems	Flower	Seed/Fruit
Biennial or short-lived perennial	Taproot	Rosette leaves are deeply lobed, grayish-green, and up to 6 inches long; stem leaves finely divided into linear segments.	Up to 4 feet tall and highly branched	One pinkish-purple flower on each branch; top of flower bracts are dark colored and fringed (image a.)	Black seeds, 1/8 inch long with bristly tips

#### BIOCONTROL AGENT DESCRIPTION

- Larvae are white, C-shaped, with brown head capsules
- Adult lesser knapweed flower weevils (*Larinus minutus*) are 4-5mm long, adult blunt knapweed flower weevils (*L. obtusus*) are 5-7mm long; both are a mottled dark brown color with a large bent snout

#### MONITORING

- Inspect dried-up knapweed plants for adult exit holes in the seed heads, which can be done throughout the year
- From late spring to late summer, visually inspect or sweep net for adult weevils or dissect the seed heads to observe larvae or pupae

#### BIOCONTROL AGENT IMPACT

- Larval feeding destroys a large portion of developing seeds, which reduces the rate of knapweed spread
- Adult weevils present in large numbers can cause severe feeding damage to stem and foliage, which can stunt or even kill some plants

LIFE CYCLE	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Spotted Knapweed				Rosette		Bolting		Flowering		Seeding/ Rosette Regrowth		
Knapweed Flower Weevil	Overwintering Adults									Overwintering		
					Adults							
							Eggs					
							Larvae					
								Pupae				

## HOW TO USE

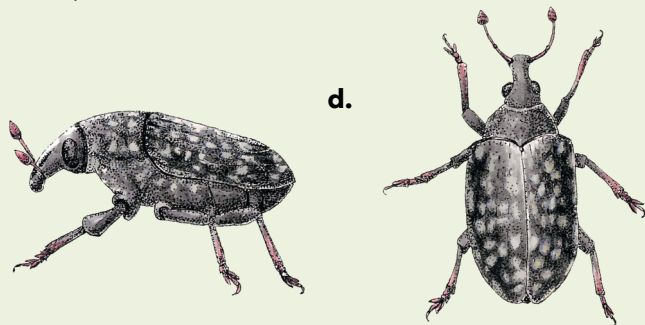
- Release 200+ adult weevils in warm, dry areas with a minimum of 1 acre infestation (infestations of 5 or more acres are preferable)
- The greatest impact is observed when the knapweed flower weevil is combined with other spotted knapweed biocontrol agents (knapweed root weevil, knapweed moth)

## NOTE

- Spotted knapweed flower weevils can also be used on diffuse knapweed
- Blunt knapweed flower weevil (*L. obtusus*) prefers spotted knapweed, while lesser knapweed flower weevil (*L. minutus*) prefers diffuse knapweed
- The weevils are difficult to differentiate via visual inspection and many releases contain a mixture of both species

## IN MONTANA

- These weevils are widespread and therefore monitoring for presence should occur before making releases with the likelihood that releasing additional weevils is unnecessary
- The weevils greatly damage diffuse knapweed and are decreasing seed production in spotted knapweed



### IMAGE KEY

- a. Spotted knapweed flowerhead (Matt Lavin, Wikipedia Commons)
- b. Spotted knapweed typical plant (Montana Biocontrol Coordination Project)
- c. Adult knapweed flower weevil, *Larinus* spp. (Montana Biocontrol Coordination Project)
- d. Adult flower weevil, *Larinus* spp. (not to scale)
- e. Flower weevil emergence hole in spotted knapweed flowerhead
- f. Flowering spotted knapweed seasonal changes; budding in spring and early summer (left), mature flowers in summer (center), seeding in fall (right)

Illustration Credit: **d–f.** Evelyn Neel, [www.evelynneel.com](http://www.evelynneel.com)

