

# BIOCONTROL OF SPOTTED KNAPWEED

## KNAPWEED ROOT WEEVIL

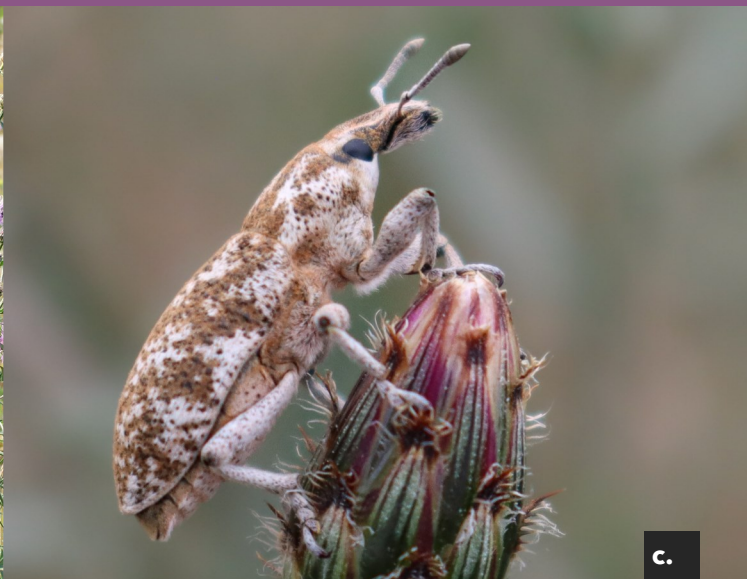
CYPHOCLEONUS ACHATES



a.



b.



c.

### 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 or pale yellow with brown head capsules
- Adult weevils are 13-15 mm (1/2 in) long with short, thick snouts and brownish gray spotting

### BIOCONTROL AGENT IMPACT

- Larval feeding within the roots reduces knapweed biomass and density, and may kill small plants
- Most damage is done when multiple larvae occupy the same root

### MONITORING

- Visually inspect or sweep net for adults on hot afternoons (above 80°F) during mid to late summer
- Pull roots year-round, inspecting for hollow chambers in roots caused by larvae or larval feeding damage
- Large C-shaped larvae, pupae, or adults can be found within the roots from mid-late spring to late summer

LIFE CYCLE	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
SPOTTED K NAPWEED				Rosette		Bolting		Flowering		Seeding/ Rosette Regrowth		
KNAPWEED ROOT WEEVIL							Adults					
								Eggs				
							Larvae					
	Overwintering Larvae										Overwintering Larvae	
							Pupae					

## HOW TO USE

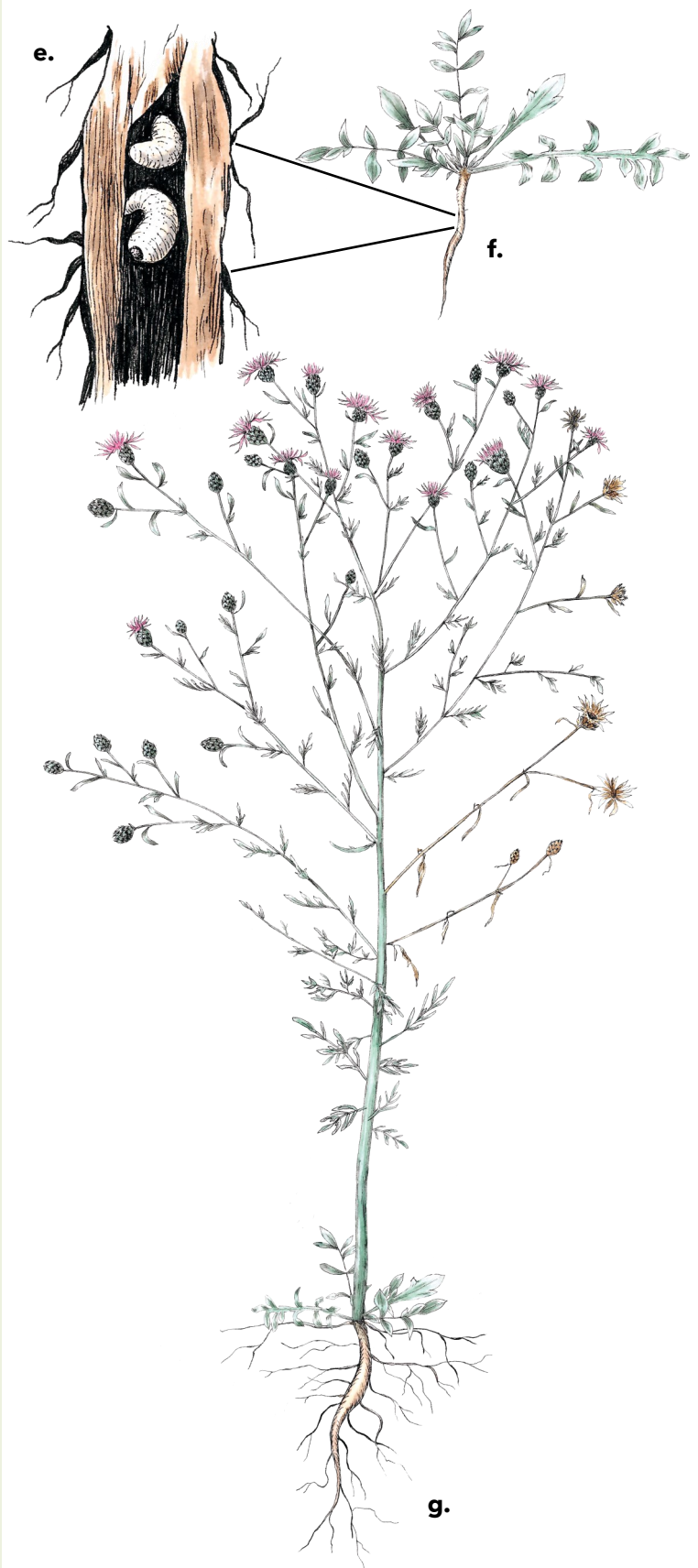
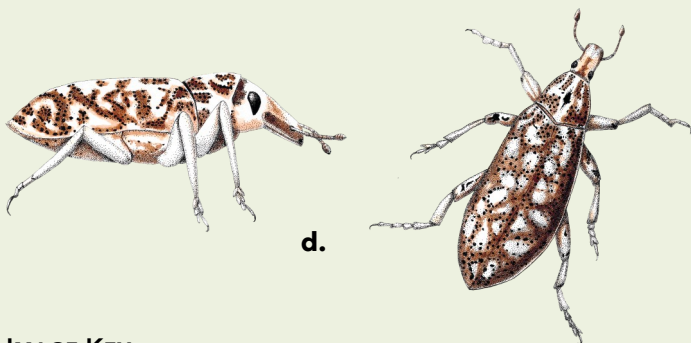
- Release 100+ adult weevils in areas with a minimum 1 acre infestation (infestations of 5 or more acres are preferable) in late summer to early fall
- Ideal release sites should be hot, dry, and flood resistant
- Place weevils directly on knapweed plants
- The greatest impact is observed when the knapweed root weevil is combined with other spotted knapweed biocontrol agents

## NOTE

- Knapweed root weevil larvae are C-shaped, while knapweed moth larvae are slender and straight
- It is difficult to distinguish between larval feeding by the knapweed moth and root weevil
- The knapweed root weevil will also attack diffuse knapweed

## IN MONTANA

- Well established in many areas throughout the state but work best at elevations below 5500ft
- They are unlikely to move to new infestations without help since they do not fly



### IMAGE KEY

- a.** Spotted knapweed flowerhead (Matt Lavin, Wikipedia Commons)
- b.** Spotted knapweed typical plant (Montana Biocontrol Coordination Project)
- c.** Adult knapweed root weevil (Montana Biocontrol Coordination Project)
- d.** Adult knapweed root weevil (not to scale)
- e.** Knapweed root weevil larvae in spotted knapweed taproot
- f.** Spotted knapweed rosette visible in spring and fall
- g.** Flowering spotted knapweed seasonal changes; budding in spring and early summer (left), mature flowers in summer (center), seeding in fall (right)

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