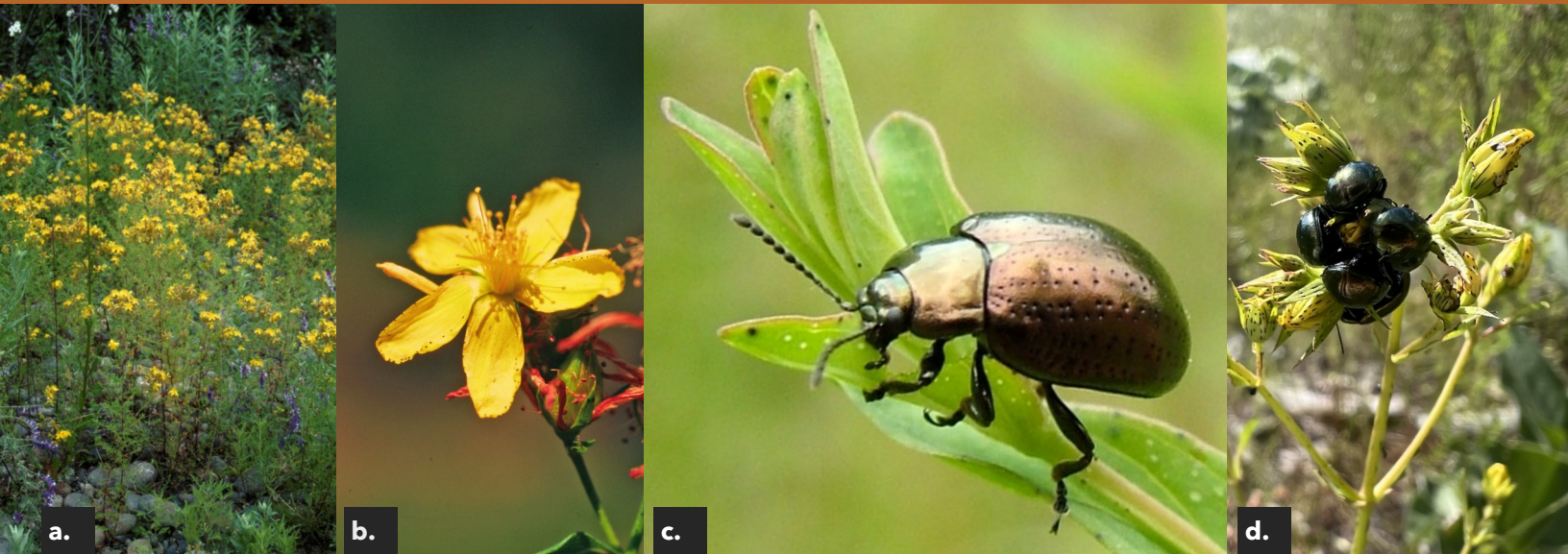


# BIOCONTROL OF ST. JOHNSWORT

## KLAMATH BEETLES

*CHRYSOLINA HYPERICI* & *C. QUADRIGEMINA*



### ST. JOHNSWORT (*HYPERICUM PERFORATUM*) PLANT GUIDE

Life Cycle	Root	Leaves	Stems	Flower	Seed/Fruit	Toxic
Perennial	Tap-root and lateral roots	Oval-shaped leaves up to 1 inch long, opposite, lack stalks and teeth, darker green with rolled edges and tiny transparent dots on the surface	1 to 5 feet tall, reddish with black dots (glands), erect, with 2 opposite longitudinal ridges, branching near the top	Numerous 5-petaled yellow flowers form flat-topped clusters at the end of branches, up to 1 inch in diameter, black dots along the petal edges	Rust-colored seed pods are ¼ inch long and contain numerous seeds in three-pointed capsules	Horses, cattle, sheep

#### BIOCONTROL AGENT DESCRIPTION

- Larvae are initially orange before turning gray, and about 6mm (1/4 inch) long
- Adult beetles are oval-shaped, shiny metallic with green, bronze, or blue undertones, and about 6mm (1/4in) long (image **c.**)
- Two species of Klamath beetles, *Chrysolina hyperici* and *C. quadrigemina*, are established in North America and look very similar

#### BIOCONTROL AGENT IMPACT

- When high numbers are present, larval and adult feeding can heavily defoliate plants, affecting photosynthesis

#### MONITORING

- During late spring to mid-summer, visually inspect plants or sweep net for adults

LIFE CYCLE	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
ST. JOHNSWORT			Rosette		Bolting		Flowering		Seeding			
KLAMATH BEETLES					Adults							
				Eggs								
				Larvae								
					Pupae							
	Overwintering as Eggs, Adults or Larvae								Overwintering as Eggs, Adults or Larvae			

## How to Use

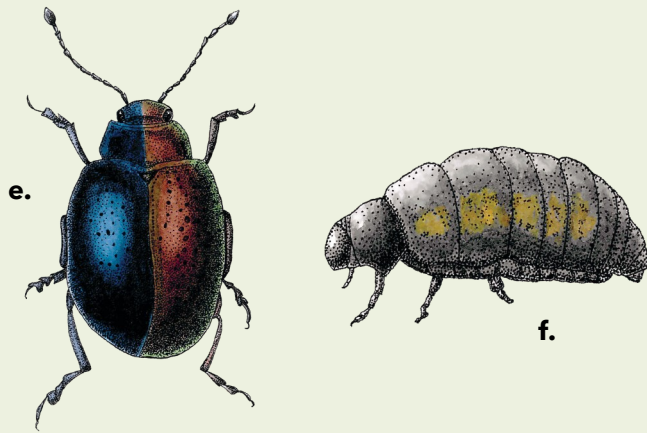
- Release 200+ beetles in sunny, open areas in a minimum of 1 acre infestation (infestations of 5 or more acres are preferable)

## NOTE

- Larvae feed at night and may be difficult to locate
- Populations of both the weed and beetles often follow periodic high and low population cycle

## IN MONTANA

- This biocontrol agent can be found throughout Montana, generally in low numbers
- Unlike populations of this beetle in states with a more moderate climate, this beetle produces only one generation per year in Montana, making them only moderately effective
- *Chrysolina quadrigemina* prefers dry conditions and more mild temperatures than *C. hyperici*, which is more cold and moisture tolerant



## IMAGE KEY

- a.** St. Johnswort typical infestation (John M. Randall, The Nature Conservancy, Bugwood.org)
- b.** St. Johnswort flowerhead (Steve Dewey, Utah State University, Bugwood.org)
- c.** Adult Klamath beetle (Cheryl Moorehead, Bugwood.org)
- d.** Cluster of adult Klamath beetles on budding St. Johnswort (Montana Biocontrol Coordination Project)
- e.** Adult Klamath beetle showing variation in metallic undertones of both species, *Chrysolina hyperici* and *C. quadrigemina* (not to scale)
- f.** Klamath beetle larva (not to scale)
- g.** Flowering St. Johnswort seasonal changes; bolting in spring (left), mature flowers in summer (center), and seeding in fall (right)

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

