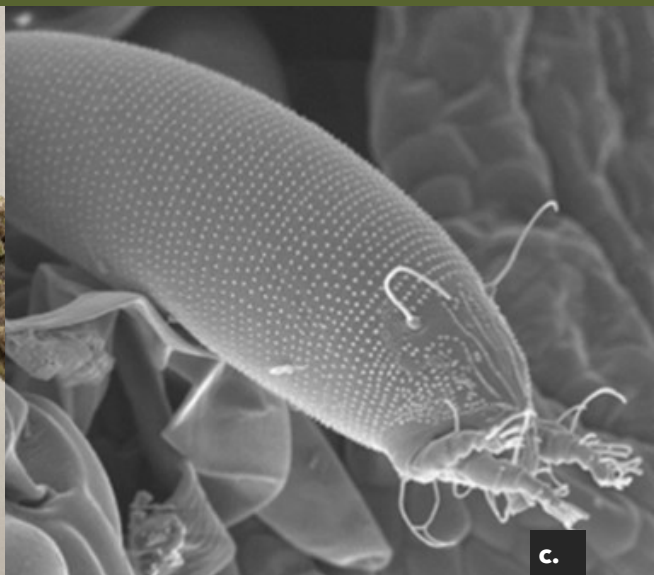


BIOCONTROL OF WHITETOP

WHITETOP GALL MITE

ACERIA DRABAE



a.

b.

c.

WHITETOP (*LEPIDIUM DRABA*) PLANT GUIDE

Life Cycle	Root	Leaves	Stems	Flower	Seed/Fruit	Toxic
Perennial	Rhizomes	Blue-green to gray-green, covered with soft white hairs, lance- to arrowhead-shaped, alternate on stem (stalked on lower stem and clasping the upper stem)	Up to 2 feet tall	Numerous white flowers with 4 petals borne on 1/2 inch long stalk; dense clusters create white, flat-top appearance	Dark brown, somewhat heart-shaped, 0.08 inches long	Cattle

BIOCONTROL AGENT DESCRIPTION

- All stages of this mite are very small and are best viewed using a high quality microscope
- Eggs are round, white to slightly yellow, and approximately 0.04mm (.001 inch) diameter
- Adult mites are 0.2-0.3mm (.007in) in length, and usually translucent to opaque white, often turning yellowish-orange with age
- Whitetop mites have four life stages: egg, first instar (developmental stage) larva, second instar larva, and adult
- Development from egg to adult takes 10 to 14 days, dependent on temperature, and there are multiple generations per year

BIOCONTROL AGENT IMPACT

- As plants develop in the spring, mites feed on the developing tissues and induce gall formation (a deformed appearance or abnormal growth that forms on the plant)
- Mites impact seed production and plant height, with the number of seeds decreasing as gall formation on the crown increases

LIFE CYCLE	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
WHITETOP	Overwintering Rosettes		Bolting	Flowering	Seeding			Overwintering Rosettes				
WHITETOP GALL MITE	Overwintering Adults			Adults					Overwintering Adults			
				Eggs								
				Larvae								

MONITORING

- Whitetop plants attacked by the gall mite can be identified by the presence of clumps of contorted gall tissue (image **b.**, **e.**, and **f.**), and by their stunted growth

How to Use

- During late spring and early summer, release mites by dispersing galls and infested plants
- Recommended release sizes are several hundred to several thousand individual mites per site
- Whitetop plants at the release site need to be in the vegetative stage at the time of release

NOTE

- Since the mite has only been recently introduced, it is difficult to determine impacts on plant density and preferred habitat
- The impact of galls may differ from site-to-site with differences in microhabitat

IN MONTANA

- The whitetop gall mite was approved as a biocontrol agent in the US, and released in Montana in 2019
- Populations have established across Montana at 26 initial release sites
- It is expected to establish across the range of whitetop in North America based upon climate matching collection sites in the insect native range

IMAGE KEY

- Whitetop infestation overview (Montana Statewide Noxious Weed Awareness and Education Program, Montana State University, Bugwood.org)
- Whitetop flowerhead galls from whitetop gall mite (Jeff Littlefield, Montana State University)
- Electron micrograph image of whitetop gall mite (A. DeMeij, Montana State University)
- Typical whitetop flowerhead without galls from the mite; typically seen in spring and early summer (Montana Statewide Noxious Weed Awareness and Education Program, Montana State University, Bugwood.org)
- Whitetop with galls from biocontrol mites; galls visible from late spring to late summer (Jeff Littlefield, Montana State University)
- Whitetop gall appearance in late summer (Jeff Littlefield, Montana State University)

