



Redberry Mite on Blackberry

[*Acalitus essigi* (Hassan)]

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Quick Facts

- Redberry mite is a microscopic pest of wild and cultivated blackberries. It was first detected in Utah in 2017 in Davis County.
- Redberry mite injects a toxin as it feeds that causes fruit sections to remain red on an otherwise mature berry.
- “Redberry disease” refers to the symptoms caused by redberry mite.
- Symptoms include persistent red color at harvest time, deformed and hardened drupelets, and distorted flavor. All or only part of the blackberry can be affected.
- Redberry mite is most damaging to late bearing blackberry cultivars.
- Once redberry disease is visible, chemical treatments are ineffective for that season’s crop.
- Redberry mite is not an economic pest of raspberries.

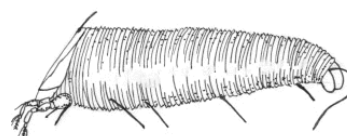


Figure 1. Redberry mite damage on mature blackberry (top image); Adult redberry mite illustration (bottom left); Magnified eriophyid mites inside a plant gall (bottom right).

Redberry mite (Order Trombidiformes, Family Eriophyidae) is a microscopic, wormlike mite that is a pest of wild and cultivated blackberry (*Rubus* spp.) (Fig. 1). In the U.S., redberry mite is a threat to commercially grown blackberries and can affect fruit quality, flavor and marketability. In Utah, redberry mite was first reported on blackberry in Davis County in 2017.

Redberry mite occurs on many continents and has been documented on other *Rubus* hosts including whitebark raspberry (*Rubus leucodermis* Douglas), loganberry (*R. x loganobaccus* L.H. Bailey), dewberry (*R. ursinus* Cham. et Schldl.), and boysenberry (*R. ursinus x idaeus* L.); however, economic damage is only known to occur on blackberry.

Redberry mite belongs to the mite family Eriophyidae, which consists of eriophyid (“er. ee. oh. PHY. id”) mites that cause galls, distortions, bronzing, and fruit russetting on a wide variety of plants. Mites in this family are highly host-specific and rarely cause serious damage. For additional information on eriophyid mites, refer to the USU Extension Fact Sheet [Eriophyid Mites: Bud, Blister, Gall and Rust Mites](#).

DESCRIPTION AND LIFE HISTORY

Adult redberry mites are microscopic, approximately 0.004 in (0.1 mm) long with a tapering body that is translucent white to very light amber in color. A piercing mouthpart and four legs (most adult mites have eight legs) are located in the front head region.

Redberry mite overwinters as adults and can be found within bud microhabitats, in live fruits and young shoots, and in other crevices on the plant. Research on European blackberry shows the mites aggregate in buds and leaf axils on first-year canes (primocanes) and second-year canes (fructocanes), as well as in berries and bracts on fructocanes (Davies et al. 2001), surviving temperatures

as low as 21 °F (-6 °C) (Jeppson et al. 1975).

In spring when flower buds appear, the mites emerge from overwintering sites and crawl to buds and drupelet bases and around the berry core and stem ends. In Washington state, females begin laying eggs around the buds in early March. Egg-laying increases in September when the mites are most abundant (over 600 were counted in September on a single berry) and gradually tapers off, ceasing in early December (Breakey and Webster 1951; Jeppson et al. 1975). Many generations occur per year. In Australia, redberry mite reproduces throughout the year, and infestation occurs during the early green stages of fruit development with numbers increasing significantly during the red fruit stage (Davies et al. 2001). The mites will largely remain on fruits until the drupelets begin to decompose in autumn.

DAMAGE

Although redberry mite causes some damage to cane buds, the main damage is the abnormal drupelet development that occurs from the mite injecting a toxin while feeding at the base of young drupelets. Symptoms of redberry mite, referred to as “redberry disease,” include deformed and discolored drupelets (small fruit sections) that remain hard and bright red (or less commonly hard and green), failing to mature normally (Fig. 2). Symptoms may be visible from one drupelet to the entire berry. Infested berries gradually dry and fade during autumn and winter. Redberry mite can cause crop losses when very high populations are left uncontrolled (Univ. of California 2015). Take care to not confuse mite injury with sunscald, which is caused by high temperatures and intense afternoon sunlight and results in white drupelets that eventually dry out (Fig. 3).

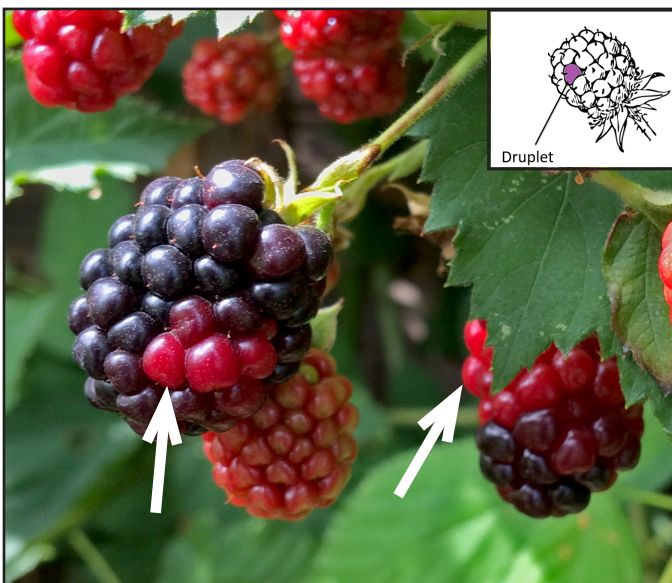


Figure 2. Redberry mite damage on blackberry. Infested drupelets remain red on an otherwise mature berry (main image); Drupelet illustration (inset).



Figure 3. Redberry mite damage on mature blackberry (left); Sunscald damage (right).

MANAGEMENT

Monitoring

If present, redberry mite can be readily found using a 20-30x hand lens or magnifying glass, however the mites will still be difficult to see at that magnification. To look for mites, pull apart the drupelets of unripe berries in the green to pink stages, and closely examine the base of individual drupelets. Visually inspect ripening berries for abnormal coloring: affected drupelets will remain hard and red (or less commonly, hard and green) while the remaining drupelets normally soften and turn black. Damage is most noticeable as the fruit reaches maturity.

Cultural

Early maturing blackberry varieties harvested prior to mite population buildup usually have minimal or no damage. Select early bearing varieties that are hardy for your location (refer to the USU Extension Fact Sheet, [Selecting Blackberry Cultivars for Utah](#) and the [USDA Plant Hardiness Zone Map](#)). In the U.S., most problems with redberry mite infestations historically were with Evergreen and Himalaya varieties (Breakey and Webster 1951). Late maturing cultivars such as ‘Apache’, ‘Chester’, ‘Illini Hardy’, ‘Navajo’, ‘Thornless Evergreen’, and ‘Triple Crown’ allow more time for mite populations to increase and are at greater risk for damage (Vacante 2016). Although ‘Loch Ness’ is a mid-season producer in Utah (Black et al. 2018), it has been shown to be a variety susceptible to redberry mite infestation (Vacante 2016). When growing primocane-flowering cultivars, such as ‘Prime Jim’ and ‘Prime Jan’, damage from redberry mite can be greatly reduced by mowing the canes to the ground each fall to eliminate overwintering sites and reduce subsequent mite populations (Murrietta and Gaskell 2016).

Biological

Some predatory phytoseiid mites can be effective natural controls of redberry mite and have been shown to assist with increasing

redberry mite mortality rates (Jeppson et al. 1975). The extent to which these predators may be used as biocontrol agents for redberry mite has not yet been established.

Chemical

Once redberry mite damage is observed, chemical applications for that growing season are not effective. Prior to symptoms being visible, control can be achieved using either wettable sulfur or horticultural oils. Note that oil and sulfur or sulfur-containing products (such as some fungicides/miticides) should never be mixed together or applied within 30 days of each other because of the risk of plant injury (phytotoxicity).

Wettable Sulfur: After initial leaf buds swell, but before the buds open, apply wettable sulfur (consult label for rate and use directions). Apply sulfur again when canes are in full leaf and just before the first flowers open. As wettable sulfur is toxic to bees, applications should be made when bees are inactive: apply before flowers open, and during evening hours (dusk) once flowers have opened to allow the sulfur to dry before bee activity resumes the following morning.

Horticultural Oil: Alternatively, when fruit are in green to first pink stage, apply horticultural oil (such as SunSpray or Stylet Oil) at a rate of 1-2% by volume. Repeat the oil application every 2 to 3 weeks up to four total applications. As a preventative, thorough coverage is critical to prevent mites feeding deep within the fruit. As blackberry leaves can be sensitive to oil sprays, apply a test spray on a few plants and observe for injury (leaf scorch or wilting) within 24 hours before making a broader application. As fresh oil residues can be moderately toxic to bees, take care to apply oil at dusk once plants are in bloom.

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Figure 2. Michael Caron, Utah State University Extension (main image); University of Arkansas Agriculture Research and Extension (inset)

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