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Encountering Eriophyid Mites on Coneflower and Other Ornamentals

What are eriophyid mites? Eriophyid mites (family Eriophyidae) affect a wide variety of plants and are known as gall, blister, bud, or rust mites based on the abnormalities they cause in their host plants. Galls are abnormal growths on a plant that are often caused by plant hormones responding to irritation of cells due to insect, mite, or nematode feeding - or infection from fungi or bacteria.

Eriophyid mites live exclusively on plants and often develop and overwinter inside leaf and flower buds. These mites are known for causing a wide range of distortions such as flower and leaf galls as seen on coneflowers by the Coneflower Rosette Mite (Figure 1) and maple bladder galls (Figure 2)



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Figure 1. *Echinacea purpurea* flowers infested with the eriophyid mite known as the Coneflower Rosette Mite have a “tufted” appearance compared to flowers that do not show symptoms. Image by Beth Scheckelhoff.

caused by the mite *Vasates quadripedes*. While this damage is largely aesthetic, other eriophyid mites cause economic damage when not controlled. The tomato russet mite (*Aculops lycopersici*) causes discoloration of leaves and fruit in greenhouse tomatoes (Figure 3). *Phyllocoptes fructiphilius* transmits the Rose rosette virus to healthy rose plants causing life-long infection of plants with Rose Rosette Disease (RRD) (Figures 4 and 5). Each mite is specific to its host plant.

Eriophyid mites are anatomically different from other mite species typically encountered in ornamental production. Unlike two-spotted spider mites or broad mites, all life stages (larva, nymph, and adult) of these mites have only two pairs of legs instead of four. Their legs extend from the front of a soft, carrot-shaped body. They feed by piercing plant cells with a dagger-shaped mouthpart and removing the contents.

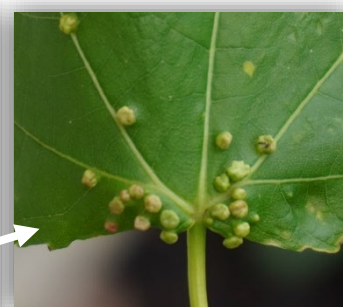


Figure 2. Eriophyid mites overwinter in buds on maple. Mites develop small bladder galls on the leaf surface once unfolded. Images by Beth Scheckelhoff.



Figure 3. Tomato russet mites (also called tomato rust mites) cause a russeting or browning of leaves, stems, and fruit. Damaged fruit are unmarketable. Images by Beth Scheckelhoff.



Figures 4 and 5. Rose Rosette Disease is caused by the Rose rosette virus which is transmitted via eriophyid mites. Images by Jennifer Olson, Oklahoma State University, Bugwood.org.



Figure 6. Tiny, carrot-shaped Coneflower Rosette mites make their way to the top of an *Echinacea* flower to be dispersed by the wind to nearby flowers. Image by Beth Scheckelhoff



Figure 7. This heavily infested coneflower is covered with eriophyid mites creating what appears to be a dusty surface. Tiny threads produced by the mites also aid in their dispersal via wind. Image by Beth Scheckelhoff

Eriophyid mites are very tiny (<350 μm or less than half a mm) and difficult to see with the naked eye. A 40x hand lens or microscope is needed to clearly see them. Therefore, recognizing the symptoms of infestation is key in first determining mite presence. Visually, these mites look like tiny specks of pollen or dust on the plant surface, and high numbers of mites together form a powdery-like appearance (Figures 3, 6, 7).

Eriophyid mites move about plants on their own. Yet, due to their small size and the production of tiny threads, they are easily and primarily transported and dispersed by wind (Figures 6 and 7) and greenhouse fans. They can also be easily moved by people and animals including other insects - as well as on tools, clothing, and infested plant material. Large numbers of mites can be found venturing to the tip of coneflowers on windy days (Figures 6 and 7).

Controlling Mites. Sanitation is important in reducing eriophyid mite populations and limiting spread. In coneflower, for example, flowers in the bud stage show symptoms of mite infestation. Growers who maintain flowering *Echinacea* plants throughout the summer and plan to hold onto plants over the winter will want to check blooms for the presence of mites. Infected blooms should be removed from plants and discarded before flowers open. Similarly, those growing roses need to monitor for signs of RRD. Suspect rose plants need to be discarded as there is no cure for infection with RRD.

Biological control is currently being investigated by using predatory mites for control of eriophyid mites in the transmission of RRD. Chemical control measures can be used though not all miticides are effective on eriophyid mites. Use caution when applying products to flowers that may be attractive to pollinators.

The following products (Table 1) control eriophyid mites (which may be listed as rust, bud, or gall mites on the product label). Any reference to commercial products, trade names, or brand names is for educational purposes only and no endorsement or approval is intended. Follow all label instructions.

Table 1. Chemical Controls for Eriophyid Mites in Ornamental and Edible Crop Production*				
Active Ingredient	Trade Name(s)	IRAC	Greenhouse label	Labeled for Edibles
Horticultural oils	various	none	Yes	Yes
carbaryl	Sevin	1A	No	Yes
methiocarb	Mesurool	1A	Yes	No
bifenthrin	Talstar, Attain TR, Ascertain TR	3A	Yes	No
abamectin	Avid, Minx 2	6	Yes	No
chlorfenapyr	Pylon, Piston	13	Yes	Yes
fenazaquin	Magus	21A	Yes	No
fenpyroximate	Akari	21A	Yes	Yes
pyridaben	Sanmite	21A	Yes	Yes
spiromesifen	Savate	23	Yes	No
spirotetramat	Kontos	23	Yes, as drench	Transplants only

*The following miticides commonly used to control spider mites and other mite species in greenhouse and ornamental production ARE NOT labeled at the time of this printing for control of eriophyid mites: acequinocyl, bifenazate, clofentezine, cyflumetofen, etoxazole, fenpropathrin, and hexythiazox

References for Further Reading

- [An Illustrated Guide to Plant Abnormalities Caused by Eriophyid Mites in North America](#). 1982. Keifer, H., E. Baker, T. Kono, M. Delfinado, and W. Styer. USDA-ARS. Agriculture Handbook Number 573.
- [Mites of Greenhouses Identification, Biology and Control](#) ZHI-QIANG ZHANG, Acarologist Landcare Research, Auckland, New Zealand
- [Rose Rosette Disease](#)

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