GROWERTALKS

Pest Management

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Identifying & Managing Broad Mites

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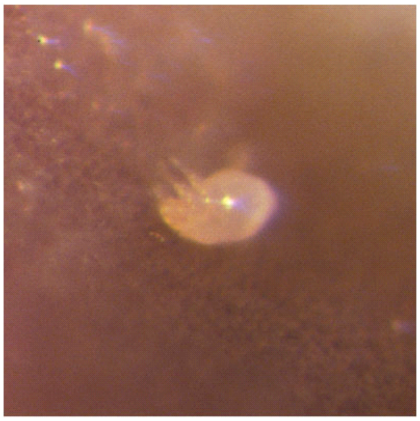
Broad mite (*Polyphagotarsonemus latus*) is a tarsonemid mite very closely related to and similar in appearance to the cyclamen mite (*Phytonemus pallidus*). Broad mites are a problem in greenhouse production systems because they feed on many greenhouse-grown horticultural crops (ornamental and vegetable), including begonia, browallia, chrysanthemum, cucumber, dahlia, eggplant, English ivy, fuchsia, impatiens, New Guinea impatiens, pepper, salvia, snapdragon, strawberry, tomato, torenia and transvaal daisy.



Close up of a broad mite adult. | Photo by Raymond Cloyd.

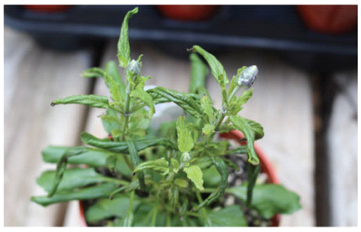
Biology

Adult broad mites are about 0.25-mm (0.0098-in.) long, oval shaped and light yellow to amber (Figure 1). There are four life stages, including egg, larva, nymph and adult. Females can lay up to 40 eggs during their two-week life span, although the number of eggs laid depends on temperature and relative humidity. Unmated females produce only males, whereas mated females produce females. Eggs are oval, white and covered with bumps (Figure 2). Six-legged larvae emerge (eclose) from eggs and develop into eight-legged nymphs that become adults. Development from egg to adult takes five to six days at 70 to 80F (21 to 26C) and seven to 10 days at 50 to 65F (10 to 18C).

Broad mites overwinter on infested plants in greenhouses and can be introduced into greenhouses on infested plant material in the spring. Broad mite populations can spread within greenhouses by air currents created by horizontal air flow fans, leaves of adjacent plants touching, and employees handling infested plants and then touching uninfested plants. Broad mite adults may also spread within greenhouses by attaching to the legs and antennae of greenhouse whitefly (*Trialeurodes vaporariorum*) and sweetpotato whitefly (*Bemisia tabaci*) adults, which means that managing whitefly populations is important in reducing the spread of broad mites among greenhouse-grown crops. In addition, male broad mites transport eggs, female nymphs and adults to the new leaves of plants.

Broad mite and egg with bumps. | Photo by Karen K. Rane.

Broad mite feeding damage on transvaal daisy leaves. | Photo by Raymond Cloyd.



Damage

Broad mites aggregate in groups, feeding primarily on leaf undersides and flowers. They feed on plant cells within the leaf epidermis using their piercing-sucking mouthparts. While feeding, broad mites inject a toxic saliva that causes twisted, hardened and distorted terminal plant growth. Additional symptoms include leaf bronzing, leaf margins curling downward and becoming brittle, and puckered and shriveled growth. Extensive populations of broad mites can lead to individuals moving and feeding on the upper leaf surface, which results in leaf distortion.

Broad mite feeding damage on salvia. | Photo by Raymond Cloyd.
Broad mite feeding damage on basil. | Photo by Vince Tuinstra.

Broad mite feeding damages the meristematic plant tissues of the growing tip or terminal shoot, which inhibits growth, decreases leaf number, decreases leaf size and area, and reduces plant height. In addition, leaves may appear darker green than normal (Figure 3; broad mite damage to salvia and basil is shown in Figures 4 and 5).

Broad mite damage resembles nutritional deficiencies, herbicide damage, watering problems or improper environmental conditions, such as temperature and relative humidity. Flower buds fed upon by broad mites may be distorted and eventually abort. To determine if plant symptoms are associated with broad mite, you'll need to look at plant parts (e.g. leaves and terminal growth) using a dissecting microscope.

Management

Broad mite management involves discarding plants exhibiting damage symptoms and those confirmed to have broad mites. In addition, remove plants adjacent to infested plants, even if they aren't showing symptoms, because the plants may be infested with broad mites. Pesticides with miticidal activity registered for use against broad mite are listed in Table 1. Those pesticides with translaminar properties may be more effective in managing broad mite populations because the material penetrates leaf tissues, forming a reservoir of active ingredient within leaves or new terminal growth.

Table 1. Common name (trade name) and activity type of pesticides registered for use against broad mite (*Polyphagotarsonemus latus*).

Common Name (Trade Name)	Activity Type
Abamectin (Avid)	Contact and translaminar
Bifenazate + Abamectin (Sirocco)	Contact and translaminar
Chlorfenapyr (Pylon)	Contact and translaminar
Fenpyroximate (Akari)	Contact
Pyridaben (Sanmite)	Contact
Spiromesifen (Savate)	Contact and translaminar
Spirotetramat (Kontos)	Contact and translaminar

Consequently, these pesticides are likely to contact broad mites feeding within the meristematic tissues. However, even after applying a pesticide to manage broad mite populations, plants may still exhibit symptoms of broad mite feeding because of the toxic saliva residing in the plant tissues.

Biological control of broad mite entails proactively releasing the predatory mites *Neoseiulus cucumeris*, *Neoseiulus californicus*, *Amblyseius swirskii* or *Amblyseius andersoni*. Predatory mites must be released early in the crop production cycle before broad mite populations become established and plant damage is noticed. Consult a biological control distributor/supplier to determine the appropriate release rates of the predatory mites.
In summary, broad mite management involves the following:

- Start with clean plant material.
- Conduct visual inspections of susceptible crops.
- Immediately remove all plants exhibiting broad mite feeding damage.
- Apply pesticides with miticidal activity early in the crop production cycle.
- Release predatory mites early in the crop production cycle. **GT**

For more information on broad mite, you can refer to the following extension publication: Cloyd, R. A. 2010. Broad mite and cyclamen mite: management in greenhouses and nurseries. Kansas State University Agricultural Experiment Station and Cooperative Extension Service. MF-2938. Kansas State University, Manhattan, KS. 4 pages (bookstore.ksre.ksu.edu/pubs/MF2938.pdf)

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