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## Distorted and Stunted Growth: *Ornamental Peppers*<sup>1</sup>

*A number of stunted and distorted ornamental peppers were recently observed with a wide range of symptoms. These symptoms were caused by broad mites, a microscopic pest which can affect a number of different plants.*

We recently observed a bench of greenhouse grown ornamental peppers (*Capsicum annuum*) with a number of extremely stunted and deformed plants. The cultivar was ‘Tango Red’, and the majority of the plants were healthy and uniform, but nearly a quarter were showing some level of symptoms. Most of the plants were flowering and beginning to set green peppers.

Damage was first noticed on one plant near the center edge of the bench. The plant was about half the size of surrounding plants (Fig. 1). Upon closer inspection, it was easy to see that the foliage was crinkled and highly distorted, especially on the youngest leaves (Fig. 2). Flower stalks also appeared short and thick, with malformed flowers (Fig. 3). The distortion was similar to the symptoms associated with boron (B) deficiency.

After seeing this first plant, we looked at surrounding plants, and noticed a wide range of

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Figure 1. The first symptomatic plant on the left was easily distinguished from the healthy plant on the right. Photo copyright by Josh Henry

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symptoms that radiated out from this center plant. Many of the plants immediately adjacent to this central plant were mildly stunted, with leaf distortion. Some plants further away appeared fine at first glance, but had visible leaf distortion on the very youngest leaves (Fig. 4). This random pattern of symptoms indicated that the issue may be biotic.

Knowing that broad mites can cause this type of damage on a wide variety of plant species, we decided to look for eggs. Broad mite eggs are similar in size to adult females, and are often found on the undersides of young leaves. Eggs are whitish and covered with rows of bumps, which distinguishes them from the eggs of other mite species. Broad mites and their eggs are only visible with a hand lens of 40x or greater. After looking under a microscope, a massive number of eggs were observed.

### Control

Proper sanitation is key to preventing broad mites from becoming an issue. Growing areas should be kept weed free and cleaned thoroughly between crops. If you have a crop with broad mites, avoid working in that area and then moving to a clean crop, as you can easily move broad mites on tools and clothing.



Figure 2. The plant here was severely stunted with malformed leaves. Photo copyright by Josh Henry

There are a number of pesticides available for control of broad mites. It is important to note that not all products labeled for spider mites will be effective on broad mites. To treat broad mites, look for a product that works on Tarsonemid mites. Abamectin (Avid), chlorfenapyr (Pylon), pyridaben (Sanmite), spiromesifen (Judo), fenpyroximate (Akari) are effective. After an initial treatment, it is beneficial to follow up with another treatment 10 days later, if allowed by the pesticide label. In bio-control systems, predatory mites can be effective when released before broad mite damage is severe. Although labeled, broad-spectrum pesticides, like some pyrethroids and organophosphates, are not recommended for controlling broad mites.

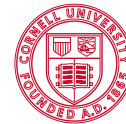
Broad mites are often hidden in buds, so miticides that only have contact activity will not be very effective. This is especially true with peppers, which may have hundreds



Figure 3. Stunted flower buds may be seen with distortion of the new growth. Photo copyright by Josh Henry

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of small flowers to hide in. Look for products that have translaminar activity, like abamectin and chlorfenapyr. Products with translaminar activity will be translocated to the growing tip where

mites are feeding, delivering greater control. Unless damage is severe (as was shown in Fig. 1), plants will likely grow out of this distortion. It's best to quickly

remove and destroy heavily infested plants when the damage is first identified, and focus on treating plants that will be saleable.

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Figure 4. Nearby plants appeared healthy until further inspection of the new growth. Photos copyright by Josh Henry and Matt Bertone.

**Broad Mite Hosts**

Broad mites are known feed on a wide variety of plants. Below is a list of crops in which broad mites have been reported.

**Field and Vegetable Crops:**

Basil, beets, beans, cantaloupe, cotton, cucumber, eggplant, mango, papaya, pepper, potato, strawberry, tea, and tomato.

**Ornamental Crops:**

African violet, ageratum, azalea, bacopa, begonia (non-stops), begonia (rieger), celosia, chenille, chrysanthemum, dahlia, exacum, fuchsia, geranium, gerbera, gloxinia, ivy, jasmine, hydrangea, impatiens, lantana, marigold, peperomia, petunia, pittosporum, plectranthus, schefflera, snapdragon, verbena, and zinnia.

**Reference:**

Baker, J. R., ed. 1978. Insect and Related Pests of Flowers and Foliage Plants. North Carolina Agricultural Extension Service, Raleigh.