Management of Broad Mite (*Polyphagotarsonemus latus*)

Figure 1: Broad mite damage on Irish potato

Broad mite has a large host range including 60 families of plants. Its vegetable hosts include beet, beans, cucumber, eggplant, pepper, Irish potato and tomato. Pest also affects papaya, certain types of citrus and ornamentals. Damage is especially severe in peppers. Broad mites are so small that they are virtually invisible on the host plant even with a good hand lens. Broad mite adults are almost microscopic (less than 0.2 mm long). They are translucent and colorless to pale brown. Unless controlled, broad mites usually destroy the commercial value of infested crops and ornamentals.

**Broad Mite Damage:**

Mites feed by piercing plant cells and sucking up the sap that oozes from the wound. Damage is caused by secretion of a plant growth regulator or toxin as the mite feeds, and significant damage can occur at very low pest density. They are found in groups hidden around the mid-vein on the undersides of the leaves and under the calyx of flowers and fruit or in protected depressions.

Their toxic saliva causes twisted, hardened and distorted growth in the terminal of the plant (Figure 1). The effects of their feeding may persist long after the mites have been controlled. Reduction in photosynthesis and instability of water balance are some the damaging effects to plants. Young, damaged leaves often become discolored, thickened and brown. Infested plants become unthrifty.

**Description and Life Cycle**

Adults move short distances by walking, but are dispersed long distances by wind or by attaching to and 'hitch-hiking' on winged insects such as aphids and whiteflies.
The egg stage is the most easily identified microscopically, they are clear, oval shaped with the surface covered in white pimples or tubercles making a spotted pattern.

Adults are oval, tapering slightly toward the rear end. Females are very small approx 0.3mm long, barely visible without magnification, males are slightly smaller, they are both transparent to yellowish green in colour, stationary when feeding, moving slowly when disturbed, the nymphal stages resemble the adults. Adult broad mite lives from 5 to 13 days the female broad mites laying 30 to 76 eggs over this period.

![Broad Mite - *Polyphagotarsonemus latus*](image)


**Figure 2: Stages of Broad mite (left image) and photo imagery of Broad mites (right)**

The life cycle through egg, two nymphal stages to adult takes between 4 to 10 days depending on temperature, with up to 20-30 generations a year if conditions are favourable. Mite damage is often reported when conditions are warm and humid. High humidity (80% to 90%) and temperatures above 25°C are favourable.

**Crop Monitoring / Prevention of Infestations**

Be aware of early symptoms, with careful crop inspection so that action can be taken early. With effective treatment to control the mites new plant growth is healthy with no long term damage unless an initial severe infestation has seriously weakened the plants.

Try not to confuse broad mite injury with virus symptoms, herbicide injury, nutritional deficiencies or physiological disorders.

- Inspect field twice per week. Get into the habit of walking right through your crop in a set pattern (M, X or Z) and checking plants at set intervals e.g. every x steps.
- Look for signs of distortion and mottling. Large numbers are not required for damage to be visible.
- Use a hand lens (at least x10) to detect the life stages of the mite. This will confirm mite presence as well as indicate effectiveness of the treatment.
- Keep good records of pest levels and treatments used.
- Avoid introducing infested plant material into the crop, e.g. with seedling plants.
- Use a fallow period, if possible, when no crop is grown to clear pest populations.
- Use seedlings that have been grown away from infested areas, i.e. start with a clean crop.
**Broad Mite Control**

The broad mite's minute size and ability to damage plants at very low densities generally results in plant injury serving as the first indication of an infestation. By this time, the pests would have spread to neighboring plants. Damage will usually start in small clumps in a field and can spread rapidly.

Monitor pest levels to act early for control. Control is simpler and less expensive when pest infestation is low and spray coverage is not an issue. Some insecticides provide excellent control, but examination of plant terminals is necessary to evaluate control success, as damage can continue to appear for two weeks after successful control.

Application of insecticide should target early infestations, because once damage is evident it may be too late to control broad mite. For such early infestations spraying can be done to clumps of infected plants and those up to 1-2 meters around. This requires very close and timely plant inspection.

Removing plants that are exhibiting symptoms, and those surrounding symptomatic plants, is essential in order to prevent the spread of broad mite onto other plants.

Chemical control of Broad mite is not difficult but problems are encountered because there are only a few chemicals registered. Most registered chemicals do not kill the egg stage or have enough residual activity to kill hatching larvae.

**Insecticide abamectin (Newmectin 1.8EC)** from avermectin group is the most effective and registered for use on Irish potato in Jamaica.

**Dose rate:**

- 0.3-1.2 Liters/hectare, or 0.12-0.48 liters/acre (4.0 oz – 16 oz. / acre)
- 2.5 ml/gallon of water (= ½ teaspoon/gallon of water).

Thorough coverage and penetration into the plant canopy is essential. Preferably apply before the build-up of mite numbers. Re-apply as pest numbers indicate. Alternate with other chemical groups. Ensure use of correct dose and volume rate by calibrating sprayer.

Recommended volume rate of spray mixture for pest control on Irish potato or peppers is 200-250 Liters/hectare (44.5 – 55.6 Gallons/hectare), or 17.8 – 22.3 gallons/acre. Lower volume is used when crop is young.

**Biological Control**

Broad mites are preyed upon by lacewing larvae, and other general predators. Farmers can also boost the numbers of beneficial insects in your crop naturally by holding back on broad spectrum insecticides, providing safe flowering plant species as habitat near the crop and maintaining higher levels of organic matter in the soil.

**References:**

1. Gabriella Caon and Tony Burfield (SARDI Entomology 2006). Broad Mite *Polyphagotarsonemus latus* (Banks) Taronemidae, ACARINA
3. Dr. Alton “Stormy” Sparks, Jr. and Dr. David G. Riley - University of Georgia. Broad mite.
Figure 3: Broad mite damage on sweet pepper  
(www.vegetablemdonline/ppath.cornell.edu & www.ent.uga.edu)

Figure 4: Broad mite damage on cucumber (left image: www.forestryimages.org) and Irish potato (right image: contributed by M. Lawrence)

Figure 5: Broad mite damage on papaya fruit  
(www.ctahr.hawaii.edu)

Figure 6: Damage on passion fruit  
(www.infonet-biovision.org)

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