

Citrus Mealybug

Raymond A. Cloyd and Clifford S. Sadof
Entomology Department, Purdue University

Citrus mealybug, *Planococcus citri*, is a pest of many flowering and foliage greenhouse plants such as; Codiaeum, Coleus, Fuchsia, Maranta, Gardenia, and many others. They feed on both woody and herbaceous plant material and can be found infesting aboveground plant parts. Mealybugs are in the order Homoptera, which includes aphids, whiteflies, and scales. While citrus mealybug is the predominant species found in most greenhouses, other aboveground feeding species such as the long-tailed mealybug, *Pseudococcus longispinus*, are common.

DAMAGE

Mealybugs damage plants by piercing tissues and sucking out sap. This can distort and yellow leaves, stunt plants, or cause them to wilt. They also can cover plants with honeydew, this is the sticky liquid excrement of mealybugs that is rich in sugar. Honeydew is an excellent medium for the black sooty mold fungus (*Cladosporium* spp.) that covers plants, reducing photosynthesis and crop marketability.

BIOLOGY

Citrus mealybug lifecycle consists of an egg stage, three nymphal stages, and adult stage. The adult female is an oval, soft-bodied, immobile insect that is covered with a white, waxy substance. Citrus mealybug can be distinguished from other aboveground feeding mealybug species by the possession of 18 pairs of short wax filaments on the body edge and one pair on the back. Adult males, which do not feed, are smaller than females and have two sets of wings. Their only task is to fertilize the females. Fertilized females lay around 600 yellow eggs in a cotton-like pouch or mass. The egg laying period takes 8

to 10 days. Once the eggs are laid, the female shrivels up and dies. Eggs hatch in about 10 days and young crawlers migrate around plants actively searching for feeding sites. After settling down to feed the female completes her final nymphal stage and then becomes an adult. A generation under greenhouse conditions can be completed in one to two months depending on temperature and relative humidity. For example, at a temperature of 79°F and a relative humidity of 60%, development from egg to larva takes 5 days and from larva to adult takes 20 days.

MANAGEMENT

1. Cultural

- Inspect all incoming plant material and isolate any plants harboring mealybug populations.
- Make weekly visual inspections throughout the greenhouse. Educate workers to recognize mealybugs and the damage symptoms so that infestations can be detected as early as possible. Female mealybugs don't fly, so sticky traps are not a feasible option for monitoring populations.
- Remove all plant debris and weeds from in and around the greenhouse.
- Remove plants immediately from the greenhouse that are heavily infested with mealybugs.
- Control ants, as they will move mealybugs from one plant to another.

2. Chemical

Chemical control of mealybugs is difficult, because the water repellency of its waxy covering prevents insecticides from making contact with the insect. The most susceptible stage to insecticides is the crawler which doesn't have the waxy covering. Most insecticides will not kill the

eggs so at least two to three weekly applications may be required to achieve satisfactory control. Thorough coverage is essential when using contact insecticides. A spreader-sticker should be added to assist in coverage, penetration, and residual activity. Systemic insecticides will kill actively feeding stages as long as enough material is translocated to feeding sites. Systemics, like contact insecticides, will not kill the egg stage. The following insecticides are registered for mealybugs:

ORGANOPHOSPHATES:

- Dursban 50WP (Chlorpyrifos)
- PT 1300 TR Orthene (Acephate)
- PT 1325 ME Duraguard (Chlorpyrifos)
- PT 1500R Knox-Out (Diazinon)

CARBAMATES:

- Dycarb, Ficam (Bendiocarb)
- Oxamyl 10G (Oxamyl)

PYRETHROIDS:

- Astro 36.8EC (Permethrin)
- Decathlon 20WP (Cyfluthrin)
- Mavrik (Fluvalinate)
- PT 1100 Pyrethrum (Pyrethrin and Piperonyl Butoxide)

- PT 1200TR Resmethrin (Resmethrin)

- PT 1800 Attain (Bifenthrin)

- Talstar 10WP (Bifenthrin)

- Tame EC (Fenpropathrin)

CHLORONICOTINYLS:

- Marathon 1G (Imidacloprid)

BOTANICALS:

- Margosan O (Azadirachtin)

- Azatin EC (Azadirachtin)

OILS:

- Sunspray Ultra-Fine Spray Oil (Horticultural Oil)

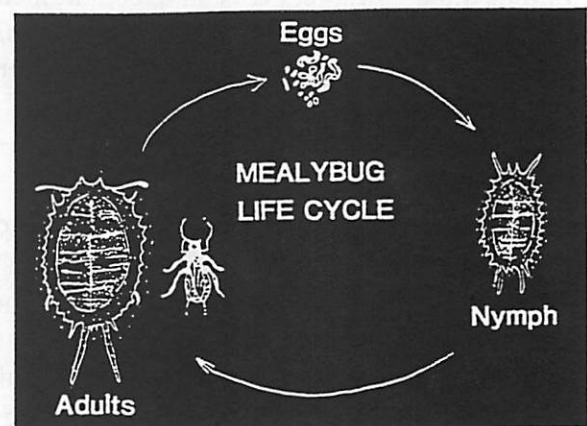
INSECT GROWTH REGULATORS:

- Enstar (Kinoprene)

3. Biological

Biological control against mealybugs consists primarily of the predatory lady beetle, *Cryptolaemus montrouzieri*, and the parasitic wasps, *Leptomastix dactylopii* and *Leptomastix abnormis*. *Cryptolaemus montrouzieri*, also known as the mealybug destroyer feeds on all species of aboveground mealybugs. Larvae are covered with a white, waxy substance that makes them closely resemble mealybugs. Its voracious appetite makes it useful for reducing moderate mealybug populations. Its activity and usefulness is somewhat reduced when days are short and temperatures are low. *Leptomastix dactylopii* and *Leptomastix abnormis* are stingless wasps that lay eggs inside young and old mealybug stages respectively. Each egg hatches into a larvae that consumes the internal contents of the mealybug and kills it. A simultaneous release of these wasps is compatible. In contrast, *Cryptolaemus montrouzieri* will eat mealybugs containing wasp larvae.

Be sure to consult supplier catalogs for release rates and any additional information.



Mealybug lifecycle.

From: R. Lindquist, Identification of Insects and Related Pests of Horticultural Plants.