



Managing Mealybugs in the Greenhouse

Introduction

Mealybugs are one of the most difficult greenhouse pests to control. Their wide host range, high reproductive potential, tendency to hide in protected locations, their ease of spread on workers, tools and plant material and ability to survive on greenhouse benches, in cracks and crevices without live plant material for two weeks, all make them challenging to eradicate.

Feeding Damage

With their piercing-sucking mouthparts, mealybugs feed on plant sap, residing in leaf and stem axils. As they feed, both nymphs (known as crawlers) and adults cause plant stunting, leaf yellowing and distortion for they may inject a toxic saliva into plant tissue. Mealybugs excrete sticky honeydew that serves as a growing media for black sooty mold fungi. If high enough populations develop, plants can become unsaleable and even killed.



Figure 1: Mealybugs and their Damage. Photo by L. Pundt

Biology and Life Cycle

Mealybugs are soft-bodied, segmented oval-shaped insects. Adult females are about 1/20 to 1/5 of an inch long covered with white, powdery, waxy secretions. Their typical life cycle consists of an egg stage (except for the longtailed mealybug that gives birth to live young), immature nymphal stages

("crawlers") and adult. The immature crawlers mature in about 6 weeks to 9 weeks. Crawlers can disperse throughout the greenhouse as workers handle plants, via air currents, and as ants move the crawlers among plants. Mature females die after egg laying. The short-lived adult males are small winged insects that do not feed. In the greenhouse, continuous and overlapping generations make control difficult.

Scouting

Early detection is difficult but is needed to avoid outbreaks. As only the short-lived winged males fly, do not rely on yellow sticky cards to detect mealybugs. Early infestations can be easily overlooked due to the mealybug's tendency to hide in protected locations. Mealybugs can be difficult to find if populations are low. Look for white flecks or cottony residues along the leaf midribs, on leaf or stem axils, stem tips and on the underside of leaves and near the base of plants. If larger plants are staked, mealybugs can even hide beneath the tape on the stake that is used to secure the plant. Adult females may crawl off plants and be found in brick crevices and under benches where they lay eggs. Honeydew, sooty mold and the presence of ants may also be an indication of a mealybug infestation. Focus on scouting mealybug prone plants such as begonia, citrus, coleus, croton, dracaena, hoyo, English ivy, ficus, fuchsia, stephanotis, schefflera, hibiscus, mandevilla, strawberry plant (houseplant), jade plants, palms, poinsettia, prayer plants, gardenia, and orchids as well as many other foliage plants. The Mexican mealybug has been found feeding on marigolds, gerbera daisies, poinsettias, begonias and chrysanthemums.

Citrus mealybug and long tailed mealybugs are two of the most common species found. In 2015, the obscure mealybug was reported from a Connecticut retail nursery. Some mealybug species (*Rhizococcus* spp. and *Phenacoccus* spp.) even feed on plant roots. Madeira mealybugs, pink hibiscus mealybugs, and miscanthus mealybugs may also occur. Identification to species is needed when using host specific biological controls. Check out Dr. Lance Osborne's University of Florida mealybug website for more information.

<http://mrec.ifas.ufl.edu/lso/mealybugs.htm>

Citrus mealybugs (*Planococcus citri*) females are small (less than 1/8 of an inch long), mealybugs with a faint purplish stripe running down their back. They also have short waxy filaments around the margin of their oval body with a slightly longer pair of filaments at their rear. They do not have tail filaments. Females produce a cotton-like egg sac containing yellow eggs and lay from 300 to 600 eggs. Eggs hatch into small, active crawlers. When the crawlers settle down to feed, they begin to secrete wax and produce honeydew. Males resemble females from the egg stage to the third instar nymphal stage. After pupating, the winged adult male emerges but only lives for 1 or 2 days and does not feed.



Figure 2: Citrus Mealybugs on Coleus. Photo by L. Pundt

Long tailed mealybugs (*Pseudococcus longispinus*) have distinctive long tails (about $\frac{3}{4}$ or more of their body length) hence their common name. Long tailed mealybugs produce live young and do not have to mate to reproduce.



Figure 3: Longtailed Mealybug. Photo by L. Pundt

Obscure Mealybugs (*Pseudococcus viburni*) looks similar to the citrus mealybugs but lack the faint grey strip running down their back and have longer tail filaments than the citrus mealybug. They have a thicker coating of wax than the citrus mealybug.

Figure 4: Obscure Mealybugs. Photos by J. Allen



Cultural Controls

Once mealybugs become established, it is difficult to achieve effective control. Adult females can live for up to 19 days without a host plant and crawlers can continue to emerge for up to 45 days.

- Start with clean plant material.
- Inspect incoming plants for signs of mealybugs.
- Keep plants well watered and do not overfeed them. High nitrogen fertility favors mealybug reproduction.
- Closely monitor mealybug-prone plants.
- Do not hold over "pet plants" that may be infested.
- Keep greenhouses as weed free as possible.
- A forceful jet of high-pressure water twice a week may help remove mealybug eggs, crawlers and adults.
- Immediately dispose of heavily infested plants.
- Power wash and sanitize greenhouse benches between crops.
- Do not reuse contaminated pots.
- Bait ants that can move crawlers around and disrupt biological controls.
- Destroy heavily infested plants.

Biological Controls

The host specific parasitic wasp (*Anagyrus pseudococci*), parasitizes citrus mealybug larvae. Both adults and larvae of the mealybug destroyer (*Cryptolaemus montrouzieri*) feed upon mealybugs that lay eggs. Green lacewings (*Chrysoperla sp.*), that are better known as aphid predators, can also feed upon mealybugs. For more see [Biological Control of Mealybugs](#) fact sheet on the UConn IPM website.

Chemical controls

Mealybugs are one of the most difficult greenhouse pests to control. Mealybugs are best treated if detected early, when populations are low. If only a few plants are heavily infested, it is best to destroy the infested plants to minimize further spread.

Control is difficult because of the mealybug's tendency to hide in protected locations and form dense colonies. Overlapping generations often occur so all life stages are present (eggs, crawlers and adults.). Contact insecticides such as insect growth regulators, insecticidal soap and horticultural oil will kill young nymphs (provided there is good coverage); however, as eggs hatch through the growing season, additional applications are needed. Two to three weekly applications of insecticides is often needed to suppress mealybugs when there are overlapping generations. Space plants to help with spray coverage. Through coverage is necessary when using contact insecticides. Use a forceful jet of water to dislodge the older instars and then apply the contact materials, such as oils or soaps. The adult mealybug's waxy covering also helps protect mealybugs from chemical exposure. Use of a spreader sticker may help penetrate mealybug's waxy covering. Overuse of certain insecticides results in the development of resistance. Read labels carefully for resistance management guidelines. Research by Herrick et al. 2018, reported less than 50% mortality when using systemic insecticides against citrus mealybugs, whether products were applied preventively or curatively. They concluded that greenhouse producers would have to resort to contact insecticides against citrus mealybugs.

Rotate among insecticides with different modes of action to help delay the development of resistance. Consult the most recent edition of [New England Greenhouse Floriculture Guide - A Management Guide for Insects, Diseases, Weeds and Growth Regulators](#) for more specific guidelines. Available from [Northeast Greenhouse Conference and Expo](#) and the [UConn CAHNR Communications Resource Center](#) for more information.

References:

Allen, J. 2016. Obscure Mealybug Confirmed in Connecticut Nursery. <http://ipm.uconn.edu/documents/raw2/950/Obscure%20Mealybug.IPMApr.2016.pdf>

Chong, J.C. 2018. Research Says Mealybugs can be Managed. Grower Talks magazine. 3 pp. <https://growertalks.com/Article/?articleid=23424>

Cloyd, R. 2011. Mealybug. Management in Greenhouses and Interiorscapes. Kansas State University Agricultural Experiment Station and Cooperative Extension Service Fact sheet. 4 pp. <https://www.bookstore.ksre.ksu.edu/pubs/mf3001.pdf>

Gilrein, D. 2013. The Usual Suspects. Greenhouse Management Magazine. <http://www.greenhousemanagementonline.com/gm0513-mealybug-control.aspx>

Gill, S. and J. Sanderson. 1998. Ball Guide to Identification of Greenhouse Pests and Beneficials. Ball Publishing. Batavia, IL. 244 pp.

Herrick, N.J., R.A. Cloyd, and A.L. Raudenbush. 2018. Systemic Insecticide Applications: Effect on Citrus Mealybug under Greenhouse Conditions. Journal of Economic Entomology. 112(1):266-276.

Osborne, L. S. 2010. Mealybugs. University of Florida. MREC. <http://mrec.ifas.ufl.edu/lso/mealybugs.htm>

Sclar, C. 2008. Targeting the White Menace: Mealybugs. Greenhouse Product News. 3 pp. <https://gpnmag.com/article/targeting-white-menace-mealybugs/>

Stimmel, J. F. 1979. Citrus Mealybug, *Planococcus citri*. Regulatory Horticulture. Entomology Circular No. 45. 5(2):21-22. Pennsylvania Department of Agriculture. Bureau of Plant Industry.

Stimmel, J.F. 1975. Long tailed Mealybug, *Pseudo coccus longissimus* [Targa.-Toss. Regulatory Horticulture. Entomology Circular No. 7. 1(2)-13-14. Pennsylvania Department of Agriculture. Bureau of Plant Industry.

By: Leanne Pundt, Extension Educator, UConn Extension, 2003, Revised 2013, 2019

Disclaimer for Fact Sheets:

The information in this document is for educational purposes only. The recommendations contained are based on the best available knowledge at the time of publication. Any reference to commercial products, trade or brand names is for information only, and no endorsement or approval is intended. UConn Extension does not guarantee or warrant the standard of any product referenced or imply approval of the product to the exclusion of others which also may be available. The University of Connecticut, UConn Extension, College of Agriculture, Health and Natural Resources is an equal opportunity program provider and employer.