

RENEW NOW



Mealybugs only seem invincible

Conquering mealybug infestations involves a comprehensive, multipronged attack plan.



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Mealybug infestations can be among the more frustrating and intractable greenhouse problems to manage. Infestations often escape notice until widely established, and root mealybugs are particularly insidious. The immature stages of mealybugs, or nymphs, settle in protected areas, away from natural enemies or other controls. Insecticides often aren't entirely effective, and even a few escapees could start a new population.



Madeira mealybug can be difficult to control. These are on hibiscus. PHOTOS COURTESY OF DANIEL GILREIN

Away from host plants, some mealybugs have been shown to survive more than two weeks, with eggs continuing to hatch for 45 days. Long-term indoor growing situations, such as orchid and foliage plant production, public arboretums, and atriums are typical places to find mealybugs, creating issues of plant sensitivity, spray coverage, and having to work around high levels of public activity. Fortunately, pesticide resistance has not been reported or confirmed in most mealybugs, including the common greenhouse kinds.

Growers should develop a mealybug monitoring plan, particularly where there's a history of infestation. I know of no better way than simple visual inspection of the usual mealybug hiding places – under leaves, on stems, and in growing points and leaf axils. Look for all evidence – mealybugs, nymphs, cottony egg masses (most species), and cottony wax residue. Infestations can be isolated, or they may be found on a few plants or in a general area.

Next, identify what kind of mealybugs are present. Citrus and longtailed mealybugs are the most common. Citrus have short waxy rods of roughly similar length around the body and one darker stripe (where wax is thinner) down the center of the back. They produce some cottony egg masses as well. Longtailed mealybugs have two sets of longish white 'tails' extending from behind, but produce no egg masses.

Less common and more difficult to control is Madeira mealybug. Similar to citrus mealybug, it is pale gray in color, has shorter waxy rods around the perimeter, bears three rows of white waxy tufts down the back, and has numerous cottony egg masses. Root, hibiscus, solenopsis, papaya, obscure, and several others are known. Dr. Lance Osborne's University of Florida website (<http://mrec.ifas.ufl.edu/iso/mealybugs.htm>) has many helpful photos and descriptions. Identifying the species can help determine a control strategy including use of biological controls.

Third, sanitation is an important – and neglected – part of managing mealybugs. In one greenhouse, the grower cleaned up an entrenched and serious problem by 'fallowing' or power-washing benches between crops and not planting in recently used pots. 'Spot' infestations were eliminated by discarding the most infested plants – insecticides weren't going to work well for these anyway. Arboreta sometimes 'power wash' the mealybugs directly off tougher plants. Isolating infested material from clean crops might be possible in some cases.

Where tolerated, chilling plants (such as fuchsia, citrus, camellia) for 36 hours or longer at 36 degrees F can kill mealybugs, according to work by Dr. Casey Sclar. Work in Maryland showed hot (120 degrees F) water treatment also does a good job. Be sure plants can tolerate these conditions.



Citrus mealybug on Stephanotis. The darker central stripe, just visible, is characteristic of this particular mealybug.

Biological control seems made for long-term growing situations, where mealybugs tend to be troublesome. Lacewings are predators of mealybug eggs and nymphs. Releases of the lacewings eggs or lacewing larvae can be made almost any time and can be concentrated where needed. Lightly mist foliage before scattering the eggs to help them stick. 'Mealybug destroyer' ladybeetles (*Cryptolaemus*) will perform better where mealybug numbers are high and conditions are warm and humid (64°F to 91°F, RH 70%+). They reproduce only on mealybugs having egg masses (i.e. not longtailed) and will be less active during short winter days in the north.

The immature (larval) stage of *Cryptolaemus* looks very much like a mealybug, so be sure not to confuse the two. The differences will be apparent on close inspection. *Leptomastix* wasps can be released, but work only for citrus mealybug. Availability is spotty, however, so check with suppliers before planning to use.

Despite variable results, insecticides are still valuable for mealybug management. There are several important points: systemics work well in some cases but seem to take several weeks for full results to become apparent, systemics may be less effective on older plants, foliar applications benefit from repeat applications particularly where infestations are high, and replicated trials provide helpful guidelines, but some inconsistent outcomes inherent with mealybug studies seem to be the rule.

Soil-applied systemics include Kontos, Flagship, Safari, and Marathon/Discus N/G (or generic). Foliar products include all the systemics noted as well as SuffOil-X, M-Pede, Triact 70, TriStar, Enstar II, BotaniGard, Orthene TTO/Acephate 97UP, azadirachtin products (Azatin, Ornazin, Molt-X, Aza-Direct, AzaGuard, etc.), Talus, DuraGuard, Aria, Akari (suppression), and pyrethroids (Discus N/G includes a pyrethroid as well as a systemic, Tame, Talstar or generic, Decathlon, Scimitar, Astro).



Heavy residue from mealybugs under an orchid leaf. Mealybugs can be very difficult to control on orchids; the problem was resolved through careful sanitation.

Addition of a wetting agent to the foliar spray didn't seem to increase efficacy in one trial, but I suggest including one if it improves coverage on foliage. Note any sensitive plants on labels, and when using biocontrols consider compatibility with any particular insecticide before application. Use the Biobest or Koppert 'side effects' tables at their respective websites (<http://www.biobest.be/neveneffecten/3/3/> and <http://side-effects.koppert.nl>) or contact your suppliers directly.

For best results, get your mealybugs identified, then combine sanitation with biocontrol and, if necessary, add insecticides to the mix. For heavy infestations, a systemic, followed by repeat foliar applications, may be needed. In lighter cases, either may suffice. Contact your regional specialist for a tailored strategy that works best with your situation and production plans.

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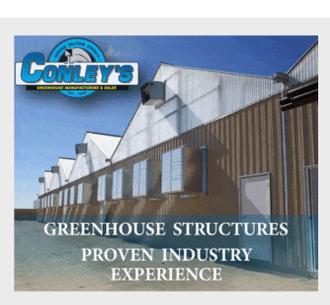
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