

## Mealybugs - Jim Brydie

To best manage an insect pest we must first know a bit about it. I have no particular expertise in the matter of mealybugs but luckily, many who do have written much to help us. Much of this article comes from the various references listed at the end of the article.

**What are mealybugs?** - Mealy bugs are insects in the family Pseudococcidae, and are closely related to the scale insects. Paul Johnson tells us that mealybugs can be thought of as a kind of soft scale that does not form the protective cover that most scales produce for protection. Unlike scale however, where the crawler stages find a suitable site for feeding and then remain fixed in place for the remainder of their life, mealybug crawlers will move about to find feeding sites while ever they live. There are hundreds of different mealybug species but many of these are restricted to particular kinds of plant hosts. Only perhaps 40 or so are found on orchids and of these, just a handful are common.

Like aphids and scale, mealybugs have piercing and sucking mouthparts that they use to feed on the sap of their host. Mealybugs tend to congregate in large numbers at leaf junctures where the petiole meets the stem, especially where new leaves are developing, and under the leaf sheaths that protect the pseudobulbs of many orchids. As a result, they are often hidden from sight until you see the damage they have caused or the accumulating waxy residue they produce. Their habit of feeding together in quite large numbers can cause severe damage if left unchecked.

As I understand it, two of the most common orchid mealybug species are the citrus mealybug (*Planococcus citri*) and the longtailed mealybug (*Pseudococcus longispinus*), but while these varieties feed only on the above ground parts of the plant, there are also root mealybugs (*Rhizoecus* spp.) which can be much more difficult to detect and manage.

**What to look for** - In general, mealybugs are more or less oval in shape, with white waxy protrusions extending from the body. There may also be 2 to 4 longer filaments on the rear end of the body. The side filaments sometimes give the impression of numerous legs (like a slater bug) but they are just protruding body filaments. Immature mealybugs can be from 0.5mm to 1 or 2mm. Adult mealybugs are usually 3 to 4mm long but some are longer. All of the known orchid feeding species are coated with a waxy secretion that hides the body of these insects, but the youngest crawlers are not usually covered. The accumulation of the waxy secretions can sometimes make a bunch of mealybugs look almost the same as an infestation of that horrible orchid scale (boisduval scale).



**The Lifecycle** - Mealybugs have a three-stage life history: egg, larva (nymph or crawler), and adult. Eggs are laid within a waxy coated egg sac produced by the female. The eggs hatch after about 10 days into the mobile nymphs (crawlers) that appear as diminutive adults. The crawlers are the most active stage that can move between plants and will develop through several growth stages before becoming adults. Adults of most species are also active and will move about to find feeding sites. In temperate regions, mealybugs usually have only one or two generations per season but in a warm greenhouse or indoors there may be upwards of 8 overlapping generations per year. Out-of-doors in cold climates, cold-tolerant species may over-winter in protected places, such as under tree bark, among roots, and in compost.

There are separate male and female mealybugs. Male mealybugs only feed in their youngest, non winged, crawler stages. Mature males are small winged creatures (1.5-2.5 mm) whose primary function is to mate, and then die.

Females do not have a flying stage but they are very mobile and will crawl off the plant and migrate throughout a growing area, making it necessary to also check for them in cracks and in joints on benches, under lips of pots and trays, and other hiding places. One of the most common pest species, especially in my collection, is the longtailed mealybug, which is parthenogenetic. This means that, similar to many aphid species, the females gives birth to live offspring throughout the season. No males are known for this mealybug species.



Mealybugs create a lot of honeydew (a sugary excretion) which make plant parts sticky and provides a substrate for sooty mould. It also attracts ants who may 'farm' the bugs and deliberately move them from plant to plant. Although some mealybugs can vector plant viruses, Paul Johnsons article from the South Dakota State University tells us that no orchid viruses are yet known to be transmitted by these insects.

The mealybugs that infest orchids do not seem to be particular about their orchid host and it seems that all cultivated

types of orchids are susceptible to them. Orchids can become infested with mealybugs by a variety of methods, including: purchase of an infested plant, movement from infested to un-infested plants that are in contact or near each other, or windblown colonization. They are active and will crawl from one plant to another, pot to pot, and across benches and even drop from an overhead plant to one below. Both indoors and outdoors, tiny crawlers can spread by floating on breezes, or the air currents produced by circulating fans and heater fans. The occurrence of infestation hotspots may be due to crawlers settling on plants where the air currents are the weakest. Similar effects are found with aphids, scales, and spider mites.

## Control Methods

**Non Chemical** - If you only have a few plants, like perhaps a couple of Phallics on your kitchen table, it may be worth manually cleaning them off with a cotton-tipped swab or ball of cotton dipped in isopropyl (rubbing) alcohol. The common 70% isopropyl available in stores is satisfactory but be careful with other forms of alcohols (such as ethanol or methanol) as these can penetrate the plant tissues and cause damage.

However, manual cleaning is a laborious process and you need to be particularly thorough. If you miss even one bug, or a few eggs, they will repopulate in what seems like no time. It is not a practical solution for a larger number of plants in a greenhouse environment. Which leads us to chemical controls.

**Chemical Controls** - Unfortunately, some of the mealybug's characteristics make even chemical control difficult.

- ]/ Their waxy body covering repels water soluble insecticides.
- ]/ Multiple overlapping generations exist simultaneously with all the life stages present (eggs, crawlers, and adults)
- ]/ They tend to group together, especially in concealed/protected areas of plants, but some will also scatter widely across benches and new plants. Meaning that spot spraying is not very effective.
- ]/ The many life cycles increases the development of chemical resistance to an insecticide if used continually.

Spraying needs to be wider than just the plant you think is the only one infected. It also needs to be thorough on all plant surfaces and surrounding benches. Where they are congregated in masses under leaf sheaths etc, I like to squirt the spray under pressure down the sheath opening so that the insecticide penetrates the waxy masses that build up around larger numbers of the bugs. The addition of a spreader/sticker to the spray (like Eco-Oil or Pestoil) is also a big help in getting the chemical to its target.

Which brings us to the traditional question of whether to use a contact poison or a systemic. The former has to actually hit the insect and be absorbed by it to kill it. The latter is absorbed by the plant and gets into the insect when it sucks the poisoned sap from the plant. Oils might be considered a third choice as they aren't really poisons. They kill by smothering the target. Insects don't have lungs, they breath via tiny tubes on their body called spiracles and when oil is sprayed on them it blocks the spiracles and smothers them. If they are covered thoroughly that is.

There are many chemicals you can use. Just stroll along the insecticide shelf at your local nursery or perhaps hardware store. Read all the labels and see which is recommended for what.

Personally, as mealybugs and orchid scale both congregate in all the hard to get at places (in cracks, down sheathes, in new leaf growths) I find that they are very hard to effectively cover with contact poisons. I like to use systemics and at present I use Confidor. However, because of the tendency of insects to build genetic resistance to a chemical if you keep using the same one, I will shortly be changing back to Dimethoate (Rogor) for a period. I have also heard some growers report good results using Neem oil or Neem extracts, which reportedly interfere with the insects ability to feed and reproduce, but I haven't tried it myself. The active ingredient of Neem is called Azadirachtin after the name of the Neem tree - Azadirachtin indica.

No matter what you use, spraying insect pests seems to be a constant battle and one you never win. The best I ever hope for these days is to keep the menaces under some kind of control. No matter what spray you use, it only kills the live bugs, and few chemicals have any effect on any eggs that may be hidden away. You need to spray several times at close intervals (a week to 10 days) to kill new hatchlings as they emerge.

**Don't forget – when you use chemicals of any kind, READ THE INSTRUCTIONS CAREFULLY and wear whatever protection is recommended. The chemicals that poison bugs will also poison you if you absorb enough. Many are cumulative poisons and will build up in your body. TAKE PROTECTION SERIOUSLY.**

## References:

- ]/ "Mealybugs on Orchids" - Paul J. Johnson, Ph.D., Insect Research, South Dakota State University
- ]/ Mealybug Management in Greenhouses and Interiorscapes - Raymond A. Cloyd, Ph.D. - Kansas State University Agricultural Experiment Station and Cooperative Extension Service
- ]/ Mealybug - From Royal Horticultural Society website at <https://www.rhs.org.uk/advice/profile?PID=201>
- ]/ Mealybugs: a Common Houseplant Pest - by Mark Shour, Department of Entomology – Iowa State University