Mealybugs

As more of the berry industry shifts towards substrate and protected production, the challenges associated with these systems are becoming more apparent. One such challenge is the increased presence of mealybugs (*Pseudococcidae*), a type of slow-moving scale insect that feeds on plant sap. They are particularly common in protected cropping environments, especially in blueberry production.

Habitat

Mealybugs are highly polyphagous pests that can attack a wide variety of plants, including fruits, vegetables, indoor plants, and outdoor ornamentals such as annuals, perennials, shrubs, palms, grasses, and trees. Common host fruit crops include but are not limited to citrus, grapes, blueberries, Rubus, stone fruits, passionfruit, avocado, macadamia, and mango.

Identification

Mealybugs are small, oval, soft-bodied insects that are covered in a white powdery wax which sometimes gives them a 'fluffy' appearance. They are commonly white, off-white or light grey in colour. The first instar nymphs are very small (<1mm) and are generally more mobile than the adults. They tend to aggregate on the underside of leaves, on stems around petioles and other tight, concealed areas of the plant.

Mealybugs at various life stages
Photo credit: Whitney Cranshaw, Colorado State University, Bugwood.org

Mealybugs are often found on the underside of leaves
Photo credit: Sally Tucker Bugwood.org

Lifecycle

Mealybugs undergo incomplete metamorphosis, meaning their life cycle has 3 main stages:

Eggs:

Laid in cottony sacs, often tucked into hidden plant crevices. A single female can lay 300–600 eggs and these hatch within 1–2 weeks (faster in warm, humid conditions).

Nymphs (Crawlers):

Newly hatched and mobile, these are yellowish or pinkish with no wax coating at first. These are the most mobile stage and spread infestation as they develop through 2–3 instars. They gradually develop the waxy coating as they mature.

Adults

Females are about 3mm long and wingless, continue feeding and producing wax, and often remain in one place. Males are rarely seen, small aphid-like winged insects which do not feed and live only a few days. Their only role is for reproduction.

Damage

High populations of mealybugs can cause stunting, premature leaf or fruit drop, and twig dieback. Yellowing, a lack of vigour and distortion are also common damage observed at growing points. Similarly to most sap-sucking pests, they produce 'honeydew', which encourages the growth of black sooty mould. In addition, this attracts ants to form a mutualistic symbiotic relationship similar to those found with aphids. This often increases the severity and scale of the infestation as it reduces predation and parasitism from natural enemies.

Monitoring

Monitoring for mealybugs can be performed through careful visual inspection of plants, including turning over leaves and checking for signs such as black sooty mould, honeydew, or the presence of ants, which often indicates mealybug activity.

Particular attention should be paid to branch junctions, leaf axils, and crevices areas where mealybugs tend to hide. Gently beating foliage over a light-coloured tray can help dislodge mealybugs for easier detection, though this method may not be effective for all species.

Plants showing signs of stress or damage should be examined more closely, using a 10x hand lens if necessary. When mealybugs are detected, it's important to look for egg masses and crawlers, as their presence indicates a growing population.

Management Options

Nymphs have the least amount of wax present on their bodies and as such are the most susceptible to pesticides and environmental conditions compared to other stages of their lifecycle. They become increasingly difficult to control once established as they tend to shelter under tight, hard to reach areas of the plant.

Cultural and physical

Temperatures of 25°C and high relative humidity are optimal for mealybugs while cooler temperatures slow down the time required for them to complete their life cycles. Manage the canopy to increase air flow, spray coverage and ease of detection. Where possible, ventilate protected cropping systems at appropriate times to reduce the favourable conditions that allow pests to establish.

Biological

Release predatory arthropods and create inviting habitats for beneficial insects. The main aphid predators include parasitoid wasps, green lacewings, and lady beetles. Parasitic wasps such as *Aphidius colemani*, *Aphidius ervi* and *Aphelinus abdominalis* are commercially available for release. *Cryptolaemus montrouzieri* is an Australian native ladybird beetle that has been recognised worldwide as an effective and efficient predator of many mealybug species. Both larvae and adults are known to feed on mealybug.

Chemical

Currently there are no synthetic insecticides that are registered for use on mealybugs in all berry categories.

Mealybug destroyer *(Cryptolaemus montrouzieri)* feeding on mealybugs Photo credit: BioBee Images

Lacewing larvae (circled in red) eating aphids Photo credit: HHelene, Getty Images

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