

Solenopsis mealybug in Australia – an overview

The solenopsis mealybug (*Phenacoccus solenopsis*) was originally described in New Mexico in 1897. First discovered in cotton crops in Texas in 1990, it caused widespread damage. Two years later it was present in Central America, the Caribbean and Ecuador. Significant damage and crop losses occurred in India and Pakistan in 2004, and by 2008 the mealybug had spread to China.

Solenopsis was first detected in Australia during the 2009-10 season on cotton in the Emerald and the Burdekin regions.

Current distribution

Solenopsis mealybug is widely distributed throughout the cotton and horticultural production regions of Queensland at low densities, and outbreaks could occur when local conditions are suitable.

It is present on cotton in the Burdekin, Emerald and the South Burnett, and at low densities on one cotton farm on the Darling Downs. It has also been identified on ornamental plants in Brisbane and Bundaberg. To date there have been no sightings in NSW.

Host range

Hosts include cotton, tomatoes, eggplant, chilli, melons, and potatoes as well as broadleaf weeds. It has also been recorded on a number of common weed species such as pigweed, stagger weed, parthenium weed, bind weed, sow thistle, bladder ketmia, native rosella, vines (cow, bell and potato), crownbeard and volunteer cotton.

Little is known about the potential impact of this pest on other broad-acre crops under field conditions. Glasshouse studies indicate a potentially significant impact on the growth of seedling and reproductive sunflowers but little impact on pulse crops (peanut, soybean and mungbean).

Identification

Females are wingless with a 3-4 mm long oval shaped body, covered with white hydrophobic (water repellent) mealy wax. Adult females and large nymphs are readily identified by two dark bands on their backs.

Adult males have a 1mm long pale grey body and a single pair of transparent wings. The adult male has no feeding mouthparts and causes no damage.

Nymphs (crawlers) are less than 1 mm, relatively bare and pearly white to yellow, without a thick coating of wax.



Female with ovisac and crawlers (left) and winged male (right)

Lifecycle

Mature females lay 150-600 eggs in waxy pouches called ovisacs. Eggs hatch quickly (35–120 minutes) into very mobile nymphs.

The female crawler undergoes three larval instars before becoming an adult (no pupal stage), with a total life span of 49-64 days, including 36-51 days as adult. Male crawlers undergo four larval instars and a pupal stage, living for 21 days (including 1-2 days as an adult). Depending on temperature, mealybug can produce 6-8 generations per year.¹

¹ Lifecycle information sourced from Vennila *et al.* (2009). Journal of Insect Science, 10:115.

Dispersal

The female mealybug cannot fly, but can move around a plant, and from plant to plant. Mealybug are generally spread as first or second instar crawlers, which readily move between plants and fields, and are also easily transported by wind and rain or in water in irrigation channels. Long-distance movement through the transport of infested plants and farm machinery is also possible.

Survival and overwintering

Mealybug can survive cold conditions, both on the host plant (below 10°C) and in the soil (0°C). During severe winter months they overwinter mainly as nymphs and live in the root zone below ground. As temperatures start to rise in September, mealybug emerge from the soil and colonise plants. In warm climates, they reproduce all year round. Their broad host range also provides the potential to survive for significant periods on a series of crop and non-crop hosts.

In a clean fallow, mealybug can survive under the soil without plant hosts. Crawlers can survive for up to 6 days without a host plant. Third instars survive much longer with 46% of mealybugs still alive after 21 days.

Impact of mealybugs

Adults and nymphs pierce and suck the sap from both soft and hard plant tissue. Feeding damage can include yellowing of leaves, stunting, distorted growth, defoliation and even plant death.

Damage in cotton can occur at all stages of crop development. Damage is often patchy, and may be worse where the crop is under stress. Heavy infestations that start early and persist can lead to plant death.

The earlier mealybug establish on cotton plants the more damage they cause as they have the opportunity to feed and breed longer. Establishment at the seedling stage can cause up to 100% yield loss.



Severe infestations in cotton can cause plant death

Establishment of mealybug up to early boll set stage causes significant yield loss while infestations at the mature (near cut out) stage can lead to an 80% reduction of fruits on top 8 nodes.

Indirect damage is caused by honeydew excreted by mealybug when feeding. Honeydew forms a sticky deposit on leaves, stems and lint and promotes the growth of sooty mould fungi which can inhibit photosynthesis and plant growth.

Other mealybug in Australia

Australia has a number of native mealybug species including the long-tailed mealybug (*Pseudococcus longispinus*), the citrophilus mealybug (*Pseudococcus calceolariae*) and the golden mealybug (*Nipaecoccus aurilanatus*). These species do not attack cotton.

See also the ***Management strategies for mealybug in the cotton farming system*** factsheet.