

# Leptomastix

## Citrus mealybug parasite

### Biocontrol organism

#### *Leptomastix dactylopii*

Leptomastix originated in South America and has proved to be a highly effective parasite of citrus mealybug. Its ability to seek out mealybugs over large areas makes it particularly efficient at controlling low-density infestations.

Leptomastix is a small brown wasp with distinctively long antennae. It is about 3 mm long, and visible to the naked eye. An adult female lays up to 80 eggs, depositing these individually into third-instar nymphs and adult mealybugs. The larvae hatch and develop fully within the mealybug, emerging 2–3 weeks later as adult wasps, ready to mate immediately and continue the cycle.

### Target pests

#### *Citrus mealybug Planococcus citri*

Leptomastix can be used to control the citrus mealybug, which is a serious pest of citrus, custard apples and many indoor and glasshouse plants. Leptomastix will not control longtailed or citrophilous mealybugs.

Mealybugs thrive in protected areas such as in the navel end and under the calyx of navel oranges, in the growing tips of many ornamental plants, and in flower buds. Mealybugs feed by sucking sap from the plant. They produce

large quantities of honeydew, which encourages the growth of sooty moulds. The citrus mealybug takes about 4 weeks to reach maturity in summer and can lay up to 500 eggs in a white, woolly egg mass.

Mealybugs are hard to control with pesticides. This is largely due to their waxy covering, their habit of feeding in sheltered areas, and the difficulty of achieving effective coverage. Mealybugs also show a readiness to develop resistance to pesticides.



Plate 57: Female leptomastix probing mealybug before depositing her egg

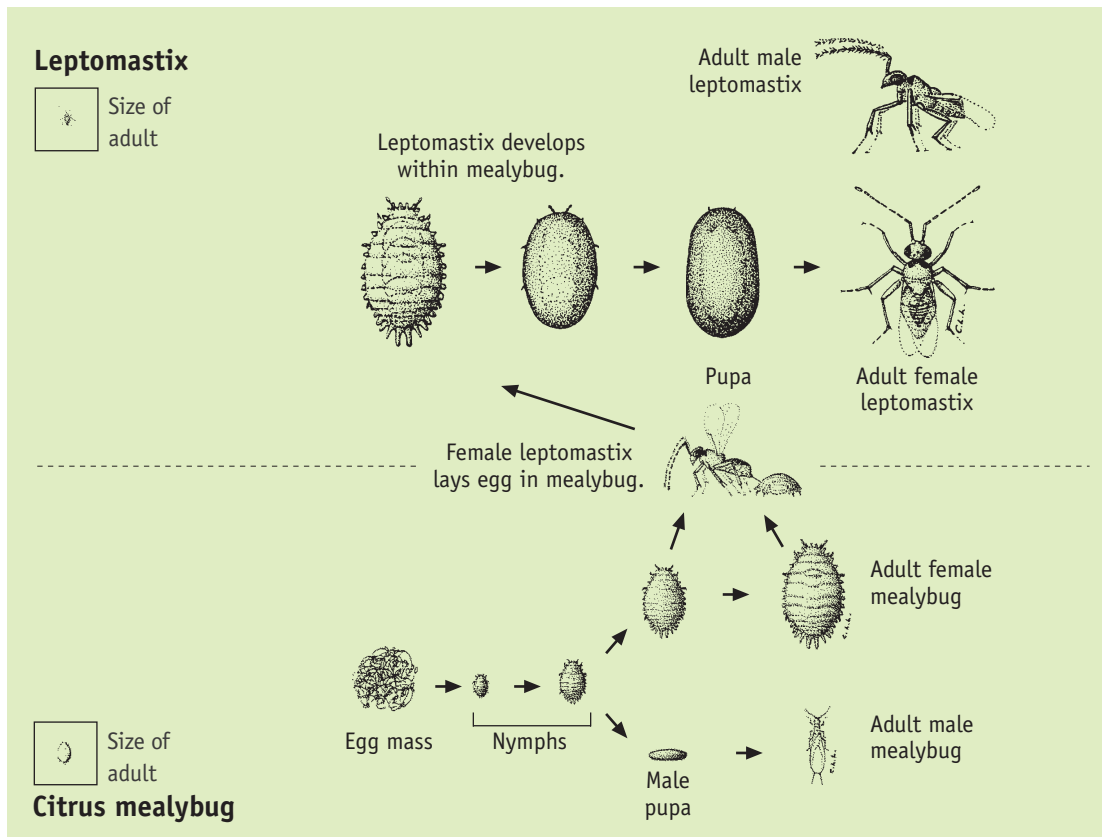


Figure 13: Life cycles of leptomastix and citrus mealybug

### Suitable crops/environments

Leptomastix is suitable for controlling citrus mealybug in citrus, custard apples and indoor ornamental plants. The parasites are most successful at temperatures of 25°C and above, as they need sunshine and warmth to remain active. They parasitise citrus mealybug only. Where other species of mealybugs occur as well, leptomastix should be used in conjunction with cryptolaemus beetles.

Like other wasp parasites, leptomastix prefers healthy, well-foliaged trees that provide shelter from extremes of heat, and low humidity. Dust is harmful to most beneficial insects and effec-

tive pest management is unlikely in dusty areas such as along roadways.

### Before release

Leptomastix is best released in spring and early summer, before mealybugs have built up to damaging levels. Best results in orchards are usually obtained by making two releases, a month apart. In glasshouse and indoor situations, regular 'dribble' releases at 4–6 week intervals give improved control. Winter has an adverse effect on leptomastix populations and wasps should be reintroduced each year before the mealybug population reaches damaging levels.

Make sure harmful residues have had time to disperse. Check chemical toxicity table for details.

### At release

Leptomastix is not currently available commercially, but attempts are being made to resume mass production of these wasps. When available, they are supplied in plastic punnets containing approximately 300 adult wasps.

### Recommended release rates

**Orchards:** Minimum 7500 wasps per hectare (25–50 punnets per hectare)

**Enclosed situations:** Minimum 1 punnet per 20–30 m<sup>2</sup>

Multiple releases may be required where there is a history of mealybug problems.

### After release

After release it is quite difficult to detect the adult wasps, as they spend much of their life cycle developing within the mealybugs. Before



Plate 58: Male leptomastix, distinguished by feathery antennae

emerging from the host mealybug, the larva of the wasp forms a brown leathery pupal case about 3 mm long. The presence of these brown pupae is the best means of confirming leptomastix activity.

Regular monitoring by an experienced scout is recommended after leptomastix is released, to ensure that the wasp has become established. As a guide, releases should continue until the characteristic leptomastix pupal cases occur in at least 30% of mealybug-infested sites.

### Cultural practices to aid leptomastix establishment

Farm practices that reduce wind, increase humidity and minimise dust in the orchard will aid the establishment of leptomastix. Weeds and cover crops between rows can be used to increase humidity within the orchard. Some



Plate 59: Leptomastix wasp with adult citrus mealybugs

weeds can be useful, by supplying nectar for adult leptomastix to feed on.

Large populations of ants may interfere with the wasps and reduce their performance. Ants should be controlled or excluded from the crop in these situations.

## Chemical use

Leptomastix is a very effective parasite of citrus mealybugs, but pesticides can easily kill it. Generally, copper fungicide and nutritional sprays will not harm leptomastix, and some miticides are also quite safe. Organophosphate and carbamate insecticides are toxic and should be avoided where possible; and synthetic pyrethroids should



Plate 60: Leptomastix adult wasp and 'mummies' of parasitised mealybugs on citrus

never be used. If an insecticide is applied, a minimum of 4 weeks should elapse before parasites are released. Drift of pesticides from neighbouring blocks should be prevented.

Endosulfan for the control of fruitspotting bug in custard apples can be used with minimal harm to leptomastix if it is applied during certain suitable 'windows'. Check with your IPM consultant for details.

## Additional information

Leptomastix is dispatched by overnight courier when available, and should be received within 1-2 days. Honey is smeared under the lids of the punnets as food for the wasps.

On arrival, the wasps should be released as soon as possible. In the event of adverse weather such as extreme heat or high rainfall, the insects may be stored for 1-2 days in a cool, dark room at about 17°C. Do not refrigerate. Place extra honey under the lids as food for the wasps if necessary.

## Other natural enemies of citrus mealybug

Cryptolaemus beetles *Cryptolaemus montrouzieri*  
Lacewings *Mallada signata*

The parasitic wasp *Leptomastidea abnormis*