



Cryptolaemus - mealybug predator

Cryptolaemus adult and larva feeding on mealybugs. Younger larvae are often confused with mealybugs.

Biocontrol organism

Cryptolaemus montrouzieri

Cryptolaemus beetles are a type of ladybird native to Australia. They are very efficient natural enemies of mealybugs, with both the larvae and adult beetles preying on these pests. *Cryptolaemus* larvae are covered in white waxy filaments, making them very similar in appearance to mealybugs. However, older larvae are larger than mealybugs and with experience, the two can be differentiated.

Adult females lay up to ten eggs per day directly into the egg masses of the mealybugs. Adult beetles and newly hatched larvae feed on the mealybug eggs and young nymphs. Larvae move to protected areas, such as the undersides of leaves, to pupate and subsequently emerge as adult beetles. The entire life cycle takes around four weeks.

Target pests

- Various species of mealybug
- Pulvinaria scales
- Soft scales

Mealybugs are a serious pest in orchards and vineyards, as well as on many indoor and glasshouse plants. They thrive in protected areas between clustering fruit, and amongst growing tips and flower buds. They feed by sucking sap directly from the host plant. All mealybugs make large amounts of honeydew on which sooty moulds grow. They take about four weeks to reach maturity in summer, producing up to 500 eggs in a white woolly egg mass.

Mealybugs are difficult to control with pesticides. This is largely due to their waxy covering, their habit of infesting sheltered plant parts, and the consequent difficulty in achieving effective spray coverage. Mealybugs also readily develop resistance to pesticides.

Suitable crops/environments

Cryptolaemus can be used to control mealybugs in a range of crops and environments. Like many other predatory beetles, *cryptolaemus* are most efficient when the host is plentiful. If the citrus mealybug (*Planococcus citri*) is present, *cryptolaemus* should be used with the wasp parasite *leptomastix* if available.

Both the adult beetles and the larvae prey on mealybugs. They survive at temperatures of 16–33°C but do best around 28°C. Adult beetles are most active in sunny weather.

Because *cryptolaemus* disperse readily, they work best if the mealybug population is large or if the beetles can be contained near the infested crop. *Cryptolaemus* perform well in glasshouse, nursery and indoor situations.

Before release

In indoor or nursery environments, *cryptolaemus* are best released whenever mealybugs are present. Best results are obtained when a full release is made early in the season, followed by smaller 'top-up' releases at intervals of between three and six weeks. This is known as the 'dribble release technique'. In orchard environments, *cryptolaemus* should be released when active mealybugs are present. Like other beneficial insects, *cryptolaemus* should be protected from extremes of heat and low humidity. Avoid using insecticides for at least two weeks before and after release.

At release

Cryptolaemus are supplied in punnets containing a minimum of 40 beetles or in tubs of 500 beetles. The container should be opened and the beetles dislodged by lightly tapping onto plant foliage near mealybug infestations.





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Recommended release rates

Orchards: Minimum 1000 beetles per hectare (25 punnets or two tubs per hectare).

Enclosed situations: Minimum one or two beetles per square metre (one punnet per 20–40 m²).

Higher rates of release may be required where there is a history of mealybug problems.

Regular 'dribble releases' of cryptolaemus are advised in nurseries and glasshouses to keep mealybugs at low levels.

After release

Beetles rapidly disperse throughout the treated area, laying eggs into the mealybug egg masses. It may then be two or three weeks before cryptolaemus larvae can be seen feeding on the pest. The adult beetles may not be obvious after release.

Regular monitoring by an experienced scout is recommended following release to check that the cryptolaemus have established. Because the younger larvae of cryptolaemus look similar to those of mealybugs, care should be taken not to confuse the two. Significant control is possible within one generation of cryptolaemus (about four weeks). However, high pest populations may take longer to control and may require 'booster' releases.

Cultural practices to aid establishment

Adult ladybirds are strong fliers and will establish best if populations of mealybugs are high or if a special effort is made to keep the beetles close to the infestation.

- **Orchard and outdoor situations:** In infested trees, branch netting cages in key locations may help improve establishment. Small shrubs may be covered with a cloth cage as described for plants in enclosed situations.
- **Enclosed situations:** A useful technique is to confine some beetles to one or two heavily infested plants with mosquito netting (or similar material) for a few days while they are laying their eggs. Avoid releasing the beetles where bright lights may attract them away from the release area.

- **In shopping centres and offices:** Release the cryptolaemus beetles after hours when lights are dimmed.

Chemical use

Pesticide residues may slow or prevent the establishment of cryptolaemus. Copper, nutritional sprays and many miticides are generally quite safe. Organophosphate, carbamate and synthetic pyrethroid insecticides are very toxic and should be avoided where possible. If these sprays are applied, a minimum of four weeks should elapse before cryptolaemus are released. Prevent drift of pesticides from neighbouring areas. Some insect growth regulators (IGRs) are also harmful to predatory beetles.

Additional information

Cryptolaemus are despatched by overnight courier where available, and should be received within one or two days. Honey is smeared under the lids of the punnets or tubs as food for the beetles. On arrival, release as soon as possible. During adverse weather such as extreme heat or high rainfall, the beetles may be stored for several days in a darkened room at about 17°C. Extra honey should be placed under the lids as additional nourishment.

Other natural enemies of mealybug

- The parasitic wasp *Leptomastix dactylopii*
- The parasitic wasp *Leptomastidea abnormis*
- Green lacewings *Mallada signata*

Excerpt from *The Good Bug Book*



Cryptolaemus adult beetles feeding on eggs of pulvinaria scale

