



Chilocorus circumdatus larva feeding aggressively on white louse scale. (Photo: Chris Freebairn)

Chilocorus - scale insect predators

Biocontrol organism

Chilocorus circumdatus

Red chilocorus is a helmet-shaped ladybird beetle, about 5 mm long. The beetles are a rich orange colour with a fine black margin around the base of the wing covers. Blue chilocorus is slightly smaller than red chilocorus (about 3 mm long) and is a deep, metallic blue colour.

Adult female chilocorus lay cylindrical eggs 1 mm beneath the cover of scale insects. At 25°C, the eggs take about one week to hatch. The larvae are voracious feeders and have pronounced spines all over their bodies. After about ten days the larvae migrate to secluded positions and pupate.

Adult beetles emerge between seven and nine days later to mate and start laying eggs about ten days after emergence. At an optimum temperature of around 28°C, the life cycle takes approximately one month. Chilocorus beetles live for between four and eight weeks.

Target pests

Armoured scale insects, including:

White louse scale (citrus snow scale) *Unaspis citri*

Red scale *Aonidiella aurantii*

Oriental scale *Aonidiella orientalis*

Oleander scale *Aspidiotus nerii*

Scale-eating ladybirds prey on a range of armoured scale insects. Red chilocorus feeds readily on white louse scale (citrus snow scale), oleander scale, oriental scale and red scale. Blue chilocorus prey on oriental scale and a range of other armoured scale species.

Scale insects feed by sucking sap from the plant. Heavy infestations may cause discolouration, leaf drop and shoot distortion., which can lead to twig dieback and even plant death.

Chemical control of scale pests is difficult because they have hard, waxy protective covers and remain stationary for most of their lives. Scale insects developing resistance to pesticides is an increasing problem in many regions.

Suitable crops/environments

Like most beneficial insects, chilocorus prefer environments protected from extremes of heat and low humidity and free from dust and toxic pesticides. They can be used in enclosed and in orchard situations.



Chilocorus circumdatus adult beetles. (Photo: Chris Freebairn)

Before release

Outdoor releases should be made early in the season before pest numbers have built up to damaging levels. Chilocorus should be released into indoor or nursery environments whenever scale insects are present. Best results are obtained when a full release is made early in the season followed by regular dribble releases at intervals of between three and six weeks. Like other beneficial insects, cryptolaemus should be protected from extremes of heat and low humidity. Avoid using insecticides for at least two weeks before release.





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Recommended release rates

- **Orchards:** Minimum 20-50 punnets per hectare.
- **Enclosed situations:** Minimum one punnet per 20-50 m².
- Higher release rates may be required where there is a history of scale problems.

After release

The beetles should rapidly disperse throughout the treated area when released. Adults will begin to consume scale insects immediately but it may be up to two weeks before larvae can be observed feeding on the pest.

Regular monitoring by an experienced scout is recommended following release to check the beetles are established. Booster releases may be needed in crops with heavy scale infestations. Do not expect to see adult beetles readily after release. Note that the young larvae are very different from the adult beetles.

Cultural practices to aid establishment

Practices that reduce wind and dust will help the beetles establish. Avoid releasing the beetles where bright lights may attract them away from the release area. In shopping centres and office blocks it is best to release beetles out of hours.

High populations of ants may interfere with the predators and reduce their performance. In these situations ants should be controlled or excluded from the crop.

Chemical use

Chilocorus beetles are very effective predators of scale insects but they may be harmed by pesticides. Copper and nutritional sprays will usually not harm them and some miticides are also fairly safe. Carbamate, organophosphate and synthetic pyrethroid insecticides are toxic. If an insecticide has been applied, a minimum of four weeks should elapse before beetles are released. Where a clean-up scalicide is

warranted, an application of narrow-range petroleum spray oil is recommended if possible.

Drift of pesticides from neighbouring areas should be prevented. Some insect growth regulators (IGRs) are also toxic to predatory beetles.

Other natural enemies of scales

- The parasitic wasps *Aphytis* spp
- The parasitic wasps *Comperiella* spp
- Green lacewings *Mallada signata*

Excerpt from the Good Bug Book



Chilocorus circumdatus adult feeding on white louse scale on citrus. (Photo: Denis Crawford)

