

CITRUS BUTTERFLIES/ ORANGE DOG

Papilio demodocus Esp.
Papilio nireus lyaeus Dbl.
Papilio dardanus Brown

1 PEST PROFILE

1.1 Distribution and status

Citrus butterflies occur in all citrus production areas of southern Africa. They most frequently present a threat to new foliage of young trees in subtropical areas, but are also known to cause serious damage in the Western Cape.

1.2 Description

The butterflies have a wingspan of about 90 mm. Their general colour is dark with marked yellow (*P. demodocus*) or either green or blue (*P. nireus lyaeus*) patches on the wings and body. A marked orange and black eye-shaped spot occurs towards the rear edge of the hind wings in the case of *P. demodocus*. White eggs, about the size of a pinhead are laid singly on young growth. They darken with age and assume a purple-brown colour shortly before hatching.

Newly emerged larvae have a spiny appearance. The larvae, popularly known as orange dogs, moult five times. Prior to the final moult the body colour is mainly black with yellow and white patches. The fully-grown larva is green with a black or brown stripe along both sides of the body. When the larva is touched or disturbed it causes a fleshy, red-brown V-shaped organ, the **osmeterium**, to protrude from just behind its head. This emits an unpleasant odour which serves as a repellent.

The fully-grown larva reaches a length of about 50 mm. It does not spin a cocoon, but attaches itself to a vertical object, which is usually a twig or branch, just before pupating. To do this the larva uses small hooks on the final abdominal segment, as well as a silken thread. The grey-brown pupa is inclined vertically away from the attachment point and looks somewhat like the remnant of a broken twig.

1.3 Infestation sites on tree

Citrus butterflies are of general occurrence and are found in home gardens as well as citrus orchards. The eggs and larvae occur on young foliage.

1.4 Damage

1.4.1 Symptoms

Young leaves are eaten inwards from the edges. Leaves can be totally consumed with consequent defoliation of twigs. Damage can be so bad that young trees are entirely defoliated and growth severely restricted. Cases have occurred where more than 30 larvae were present on trees with an initial canopy diameter of only 300 mm. After consuming all young foliage, developing larvae, if left uncontrolled, may also attack young green wood.

1.4.2 Seasonal occurrence

Young citrus growth is subject to attack throughout the year.

2 MANAGEMENT ASPECTS

2.1 Infestation/damage assessment

2.1.1 Inspection

New growth on young trees must be inspected at two-weekly intervals for the presence of eggs and larvae. Mature trees do not require specific monitoring. Rather concentrate on young trees.

2.1.2 Treatment threshold

The smaller the tree the more damage a single larva can cause. In general, no orange dog should be tolerated on trees less than four years old. As tree size increases more larvae can be tolerated per tree, provided new growth clusters are not too seriously damaged.

2.2 Control options

2.2.1 Biological

Citrus butterfly eggs are attacked by a number of parasitoid species of *Ooencyrtus* and the larvae are parasitised by *Apanteles pallidocinctus* Gahan. The pupal stage is also attacked by the parasitoid *Pteromalus puparum* L. However, it is not possible to rely on these biotic factors to achieve commercial control of the pest if numbers exceed those which can be tolerated.

2.2.2 Cultural

Orange dogs can be regularly removed by hand. However, the practicality of this procedure will be strongly influenced by factors such as tree and orchard size, degree of infestation and availability of labour. The tendency of larvae to be secluded during the day also reduces the efficacy of the procedure.

2.2.3 Plant protection products

2.2.3.1 Trunk treatment

Protectostem (acephate) stem treatments are registered for the control of these pests and some methamidophos formulations are also registered as stem treatments. Heavy infestations or populations of large larvae may need to be treated with one of the sprays below.

2.2.3.2 Spray treatments

One of the following products can be applied as an outside cover spray for control of the larvae:

Product	Dosage/100ℓ water
Dipel 2x	12.5 g
Thuricide	25 g
Lannate SL	115 ml
Lannate SP	25 g
Dursban	40 ml
Tokuthion	30 ml