

WAXY SCALE

Ceroplastes brevicauda Hall
Ceroplastes destructor Newst.

1 PEST PROFILE

1.1 Distribution and status

What we call waxy scale consists of two separate species, *Ceroplastes brevicauda* known as the citrus wax scale and *C. destructor*, the white wax scale. These occur in southern Africa on citrus and various indigenous plants. *C. brevicauda* is the most widespread species and adult females are about half the size of adult *C. destructor*. Waxy scales are usually well controlled biologically and infestations of commercial importance are mostly caused by injudicious use of plant protection products and/or poor ant control.

1.2 Description and infestation on the tree

Depending on the developmental stage, waxy scale occurs on leaves and twigs in the outer foliage canopy. Adult females of both species are covered with a thick wax layer 4 - 10 mm in diameter. Males do not occur and females reproduce parthenogenetically. Live, immobile females occur on green twigs. A female can produce 800 - 3 000 eggs under her body, after which she dies. The incubation period of eggs is about two weeks and they give rise to dark red first stage crawlers which are about the size of a pinhead.

Crawlers move to the leaves and settle along the dorsal midrib where they begin exuding wax and this gives them a star-shaped appearance. A week or two after moulting they migrate to green twigs where they remain and eventually moult to adult females. The citrus wax scale has two generations per year with crawlers being produced from March to June and again from August to November. The white wax scale only has one generation per annum with crawlers usually occurring from October to December.

1.3 Damage

1.3.1 Symptoms

Waxy scale is generally regarded as a minor, sporadic pest on citrus. It is a honeydew-producing insect leading to the formation of sooty mould on foliage and fruit. Heavy infestations can cause twigs in the outer foliage canopy to have a white appearance. In such circumstances, the copious amounts of honeydew produced result in severe sooty mould growth, with the result that trees and crop have the general appearance of being white and black with little green visible. Consult the section on SOFT SCALES regarding the effect of sooty mould on citrus trees.

1.3.2 Seasonal occurrence

Two generations characterised by well-defined crawler movement to foliage occur during November to December and June to August. In the cooler production areas the crawler movement to foliage can be more protracted than in the warmer subtropical areas. Both generations are of economic importance and can result in sooty mould damage to fruit and foliage.

2 MANAGEMENT ASPECTS

2.1 Infestation/Damage assessment

Non-bearing trees do not usually suffer from waxy scale infestations. Only two generations per year means that a serious infestation of waxy scale is unlikely to have occurred before the tree has reached bearing age. Concentrate scouting efforts on bearing trees.

2.1.1 Inspection

As soon as the nymphs and adults on twigs are covered with a continuous waxy layer they are well protected from spray treatments. When treatment is required it is therefore of great importance to ensure that it is applied while the nymphs are still on foliage. Such young stages are still susceptible to chemical treatment. After waxy scale has been noted in an orchard it must be inspected at weekly intervals to determine when the treatment-susceptible first and second instar nymphs are present on foliage. These inspections are particularly important during the periods November to January and June to August. They must be conducted on an individual orchard basis because the presence of the second instar

nymphs on foliage can vary as a result of both orchard topography as well as climate. During mid-summer these nymphs only remain on the foliage for about two weeks and this limits the time available to apply treatment. By contrast, during winter the nymphs remain on foliage for about six to eight weeks and it is easier to plan and execute a treatment if required.

2.1.2 Treatment threshold

There is no fixed infestation threshold to indicate the need for a treatment. The general presence of infested twigs on trees can be regarded as a potential hazard requiring treatment. The more frequently that treatments are applied for other pests in such an orchard, the greater the prospect that they will eliminate the natural enemies of wax scales scale and enable it them to multiply unchecked.

2.2 Control options

2.2.1 Biological

At least 18 species of parasitic wasps are known to attack wax scales. The most abundant parasitoid is *Aprostocetus ceroplastaei* (Girault), a small parasitoid (approximately 1 mm in length) characterised by being entirely black. Two other parasitoids that are commonly found are *Anicetus communis* Annecke and *Coccophagus catherinae* Annecke. Three different species of Lepidopteran larvae are also known to prey on wax scales. These are *Coccothera spissana* (Zeller), *Autoba costimacula* (Saalmüller) and *Coccidiphaga scitula* (Rambur). The pest is usually under good biological control and problems most frequently arise when treatments for other pests upset its biological balance. Measures that contribute to the biological control of other pests, e.g. efficient ant control, will make a positive contribution to the control of waxy scale.

2.2.2 Cultural

There are no cultural options that can be used for the control of waxy scale. However, unmown, natural ground covers in the interrows may benefit the natural enemy complex. Where ant control is implemented with trunk barriers, as a means of promoting the biological

control of scale, trees will need to be skirted and weeds controlled below the trees.

2.2.3 Plant protection products

One of the following treatments can be applied as a medium cover film spray to the infested foliage canopy, but are only effective before the scales develop complete waxy coverings.

Product	Dosage/100 ℓ water
Oil (narrow distillation range)	0.5 - 1.4 ℓ (depending on grade & timing)
methomyl 20% SL	115 ml
methomyl 90% SP	25 g
methidathion 420 EC	150 ml