

## CIRCULAR PURPLE SCALE

*Chrysomphalus aonidum* (L.)

### 1 PEST PROFILE

#### 1.1 Distribution and status

This scale is known in the USA as Florida red scale and in Australia as circular black scale. In southern Africa it is a minor citrus pest due to generally effective biocontrol, but it has the potential to be problematic if the beneficial insect complex is disrupted. It occurs most frequently in the Limpopo Province, Mpumalanga, KwaZulu-Natal coastal area and Eswatini (formerly Swaziland).

#### 1.2 Description

The adult female circular purple scale is approximately 2 mm in diameter with a central white cap surrounded by two brown rings that are surrounded by a broad purple band. The scale body beneath the covering is yellow, as are the eggs. Yellow crawlers hatch from the eggs and settle to form white caps and later the nipple stage. Similar to red scale, the scale covers of both sexes are initially circular, but after the first moult those of the male become oval. The full size male scale cover is much smaller than that of the adult female. The minute winged males are seldom noticed in the orchard.

#### 1.3 Infestation sites on tree

The circular purple scale is a pest of foliage and fruit. It can occur on both non-bearing and bearing trees.

#### 1.4 Damage

##### 1.4.1 Symptoms

The tissue immediately surrounding an individual scale turns yellow (chlorotic); this is particularly noticeable on foliage. Numerous scales on leaves result in general yellowing of the foliage. The dark female scale offers a marked contrast to the yellow background of the leaf. Severe infestations are particularly detrimental to tree condition and can lead to leaf- and fruit drop and severe twig die-back.

#### 1.4.2 Seasonal occurrence

There are four generations per year. First stage crawlers can establish on foliage throughout the year and also on fruit when these are present. The most obvious signs of infestation occur during mid- to late summer. Infestations tend to be patchy in any particular orchard.

The occurrence of damaging population levels of this pest is primarily the result of disruption of its natural enemies.

### 2 MANAGEMENT ASPECTS

#### 2.1 Infestation / Damage assessment

The approach to these topics is similar on non-bearing and bearing trees.

##### 2.1.1 Inspection

Foliage and fruit should be inspected at monthly intervals and can be supplementary to red scale surveys. Fruit inside the tree and higher up in the canopy should be included in any survey. This is because poorer spray coverage, and hotter temperatures disrupting biocontrol, leads to increased survival of *C. aonidum* in the tops of citrus trees.

The packhouse culling analysis of harvested fruit is very important for identifying where localized *C. aonidum* infestations may be present on a farm. These particular orchards can then be treated to prevent reinfestation of fruit in the following season.

##### 2.1.2 Treatment threshold

When 10% of fully expanded leaves or 10% of fruit are infested with live, unparasitized, circular purple scale a treatment should be applied.

### 2.2 Control options

#### 2.2.1 Biological

Circular purple scale is effectively parasitized by at least six different parasitoids of which *Aphytis holoxanthus* DeBach is the most common species. This parasitoid, which closely resembles the *Aphytis* spp. associated with red scale, can maintain commercial control of circular purple scale if it is not eliminated by

insecticides or disturbed by ant activity. *Pteroptrix smithi* (Compere), a gregarious internal parasitoid has also become established in northern citrus production areas. This parasitoid is particularly valuable as multiple adults can emerge from a single parasitized scale.

Ladybird beetles (*Chilocorus nigrita*, *C. distigma* and *Rhyzobius* [=Lindorus] *lophanthae*) also feed on purple scale. High temperatures coupled with low humidity can have a negative effect on biocontrol agents.

### **2.2.2 Cultural**

The control of ants and dust will assist the biological control of this pest. Trees need to be skirted and weeds suppressed where ants are controlled with trunk treatments. Avoid planting other crops which require extensive use of pesticides adjacent to citrus orchards. Drift from aerial applications of pyrethroids on adjacent crops is a common cause of outbreaks. Dust that can coat trees alongside untarred roads must be reduced. Such roads should be regularly wetted where possible, or speed reduction humps put in place, to reduce dust generation.

### **2.2.3 Plant protection products**

This pest may be susceptible to organophosphate (OP) sprays such as chlorpyrifos which is registered with oil. A winter oil spray after harvest can clean up the tree before the new spring flush has emerged. A summer oil spray will further reduce scale numbers and help to prevent late season infestation of fruit. Timing of sprays to coincide with crawler production is very important. Unlike red scale, the sporadic nature of purple scale infestations usually means that only individual blocks (or parts thereof) need be sprayed rather than the whole farm.