

## SNAILS AND SLUGS

Various species

### 1 PEST PROFILE

#### 1.1 Distribution and status

The large land snail, *Achatina immaculata* Lamarck and two species of slugs, *Urocyclus kirkii* Gray and *U. flavescens* (Kefer.) may occasionally be pests of young trees in subtropical areas. In the more temperate Cape Provinces and the cooler parts of KwaZulu-Natal the brown snail, *Helix aspersa* Müller, as well as the dune snail, *Theba pisana* Müller, can sometimes be serious pests. A small conical snail, the tower snail, *Cochlicella barbara* (L.), has also been associated with fruit damage in the Cape Provinces.

#### 1.2 Description

The **large land snail** hatches from yellow eggs laid in the soil and develops a conical shell which can eventually be as long as 120 mm and up to 60 mm wide. The shell of the **brown snail** is roundish and dark brown with light brown markings. It can reach a diameter of 35 mm but is commonly 25 mm. The brown snail lays white eggs in damp soil several times a year. Eggs hatch in two weeks and maturity is reached in about two years. The **dune snail** is approximately half the size of the brown snail, lighter in colour and has longitudinal stripes on the shell. It also lays eggs in the soil but does so only once a year. The **small conical snail** has a shell of approximately 12 mm long; little is known of its biology.

#### 1.3 Infestation sites on tree

Snails can be found throughout the tree. They are most visible when present on the trunk and main branches. Damage most often occurs on the lower leaves and fruit in the canopy.

### 1.4 Damage

#### 1.4.1 Symptoms

Bark is removed from young twigs, sometimes resulting in "ringbarking". Jagged holes are eaten in leaves which may still have the leaf margin and veins intact. Mature fruit may have holes in the rind up to 10 mm in diameter and penetrating into the flesh.

#### 1.4.2 Seasonal occurrence

This will depend on orchard conditions and irrigation techniques. Overhead and sprinkler irrigation increase the occurrence of these pests. Moist orchards with large, shady trees may harbour the brown snail during most of the year. Drier orchards with smaller trees will be more likely to become infested with snails during wet weather. Usually damage is caused in late summer when the branches, weighed down with large fruit, touch the ground or weeds and provide access to the tree.

## 2 MANAGEMENT ASPECTS

### 2.1 Infestation/damage assessment

#### 2.1.1 Inspection

Inspection should be conducted on both non-bearing and bearing trees. The trunk, lower foliage and fruit should be inspected at monthly intervals for snail presence and damage. Further inspections should be conducted shortly after rainfall, when snails can become active. The brown snail is nocturnal and may not be very noticeable during the day.

In the USA, pine boards (300 mm square) with 40 mm legs are often placed under about 10 trees per hectare to monitor the brown snail. Each month the number of snails underneath the board is recorded.

#### 2.1.2 Treatment threshold

Treatment should be applied when successive inspections indicate that the snail population has increased to an average of one large land snail per two trees or from two to five brown/dune snails or slugs per tree, depending on tree size.

**2.2 Control options**

**2.2.1 Biological**

Various birds prey on snails and over an extended period ducks can be used successfully to reduce snail populations in orchards. Although there are some fly parasitoids of snails in southern Africa, none of these are commercially effective. Requests to import the predatory decollate snail from the USA, where it suppresses the brown snail under certain conditions, have been denied.

**2.2.2 Cultural**

In affected areas, trees should be skirted and weeds controlled so that snails can only get into the trees via the main stem. Large land snails can be removed by hand.

Trunk barriers made from copper foil (shim) are effective in preventing snails from gaining access to the tree canopy, provided that the trees are skirted and weeds are controlled. Rolls of copper with a width of 50 mm and a thickness of 0,15 mm should be purchased. The copper is most effective when it is new and unoxidised. The copper is cut to lengths one and a quarter times the circumference of the trees to be banded. Slits, 20 mm long, are cut every 30 mm along one edge of the band. The resulting tabs of 20 mm x 20 mm are then bent perpendicular to the remainder of the band. The band is bent around the trunk with the tabs facing outwards on the top. This means that snails must first cross 30 mm of copper before reaching the tabs. The band is held in place with a paper clip.

The “Protector” ant band also provides an effective barrier against low populations of snails (see ANTS in this Chapter).

**2.2.3 Plant protection products**

A number of different bait treatments are registered and recommended for use on citrus. The baits should be sprinkled on the ground under the tree canopy, **following rain or irrigation**. The moist Mesurol/bran bait mix can also be placed in the crotch of the tree framework. These treatments

should be applied in the afternoon or evening and must not be subjected to rain or irrigation, although wetting of the pellets may be recommended in the case of certain of the products.

One of the following bait treatments can be used for the control of snails and slugs (see Table 10.1 for other products):

Product	Comments
Scatter Snail-Kill	Sprinkle granules under tree.
Snailbait	Sprinkle granules under tree.
Sluggem Pellets	Sprinkle granules under tree.
Mesurol snail & slug killer	Sprinkle granules under tree.
Mesurol/bran bait mix	Mix 250 g Mesurol WP + 10 kg bran + 15 l water. Sprinkle this mixture under the tree or in the tree crotch.

Only one non-bait treatment is registered for use on citrus, that being Kaput, which kills and repels snails. However, this registration currently only applies to the Eastern Cape Province. Kaput should be mixed as 25 l Kaput A with 5 l Kaput B (added to the water first) in 220 l of water. The trunk of the tree should be thoroughly wet by spraying with handheld lances. Caution should be taken to not spray the foliage. If applied correctly, Kaput should provide at least 10 weeks of significant control.