

ANTS

Various species.

1 PEST PROFILE

1.1 Distribution and status

Ants are indirect threats in that their activity on the citrus tree can disturb the natural enemies of various homopterous pests and prevent them from maintaining the pest populations at commercially acceptable levels. In certain cases they may also distribute immature homopterans.

Ants on the ground beneath the tree can be beneficial in that they prey on the pupal life stages of various citrus pests such as false codling moth, fruit flies and possibly citrus thrips.

Many different ant species occur in southern Africa and to a large extent the soil structure will determine which species are most abundant. The ants described below are all attracted to citrus by the honeydew produced by various homopterans such as aphids, soft scales and mealybugs. Honeydew producers often become the primary pests, but even insects that do not exude the attractant can achieve pest status when their natural enemies are disturbed by ants tending honeydew producers in the same tree. In this way, ants attracted to soft scale or aphids may interfere with biological control of red scale. Red scale may then become a more serious problem than the honeydew-producing pest. This is why ant control is so important in orchards where IPM is practised, because it can be expected that small populations of honeydew producers will be routinely present.

1.2 Description

1.2.1 Ant colony structure

All ant colonies consist mostly of workers which are sterile females. They are responsible for protecting the colony, gathering food, tending the larvae and feeding the queen. Workers may all be the same size and have the same appearance (monomorphic). Often there will be two (dimorphic) or three (trimorphic) different sizes of workers where the major (larger) workers are responsible for protection of the nest and the minor (and medium) workers

gather most of the food. Periodically the colony will produce fertile females (queens) and males which are usually both winged. These ants leave the nest and start new colonies elsewhere.

1.2.2 Identification of ants

1.2.2.1 Large ants

- The pugnacious ant, *Anoplolepis custodiens* Smith, is present in most citrus production areas in southern Africa. It is the most important and aggressive ant species found on citrus and is often responsible for outbreaks of red scale, soft brown scale and mealybug. Worker ants have 11 antennal segments and are trimorphic.

The majors are approximately 9 mm long, brown to brownish-red in colour and have dark brown or grey abdomens. The setae on the abdomen often give them a chequered appearance. The medium workers (mediae) are from 5 to 7 mm in length and the minors are from 3,5 to 5,0 mm in length. The minors and mediae appear similar to the majors but the chequered appearance of the abdomen is not as clear. The winged males are approximately 10 mm in length. The smaller workers feed on honeydew while the majors mainly prey on other insects and are not very common in citrus orchards.

- The black pugnacious ant, *Anoplolepis steingroeveri* (Forel), which sometimes occurs in orchards in the Cape provinces and the southern parts of the Limpopo Province, is darker and slightly smaller than *A. custodiens* and does not have a chequered pattern on the abdomen.
- The carpenter ant, *Camponotus rufoglaucus* (Jerd.), is very similar to *A. custodiens*, but has 12 antennal segments and is less aggressive.
- *Polyrhachis shistacea* (Gerstaecker) is a slow moving, dull black ant with long spines on the anterior end of the thorax. The workers are 7,5 to 11,0 mm long, timid, and fall off the trees when disturbed.

1.2.2.2 Small ants

- The brown house ant, *Pheidole megacephala* (F.), is a common citrus pest in most of southern Africa except for the Western Cape and the drier parts of the North-West province, where it is replaced by *P. tenuinodis* Mayr. The subspecies, *P. megacephala punctulata* Mayr, is the second most harmful ant on citrus. The workers are dimorphic with the majors being 4 to 5 mm long, with large brownish-red heads and paler bodies; the abdomen is yellowish to blackish-yellow. The minors are from 2 to 3 mm in length with brownish-yellow to dark brown bodies; they have small heads, relative to body size. The queens are 6,5 to 7,5 mm long, dark brown and with small heads. The males are slightly smaller and more slender than the winged females.
- The Argentine ant, *Linepithema humile* (Mayr), is an important citrus pest in the Western Cape. The workers are monomorphic, approximately 3 mm long, and brownish-black. The queens are approximately 6 mm long, and of the same colour, or slightly darker, than the workers. The brownish males are approximately 4 mm long and always winged; they die soon after fertilising the queens. These ants are usually inactive in winter.
- Many species of cocktail ants, *Crematogaster* spp., are known in southern Africa, some of which are occasionally pests in citrus orchards. These ants are not very active and most live in trees in nests constructed from organic matter. They are easily recognised by the habit of raising their abdomens when disturbed. The workers of the various species range in size from 2,5 to 6,0 mm in length and from yellowish-red to black. The males are usually the same size as the workers, but the queens are larger.
- The little, ubiquitous brown ant, *Technomyrmex albipes* (Sm.) *foreli* Emery, occurs in citrus orchards throughout southern Africa, but is most common in the Western Cape. The species is monomorphic. The dark brown workers resemble those of the Argentine ant, but they are smaller (approximately 2 mm). They can

raise their abdomens in the same way as cocktail ants. The queens and males are approximately 3 mm long and appear similar to the workers.

1.3 Infestation sites on tree

Ants are most noticeable on the trunk and on closer inspection will be found in the canopy tending honeydew-producing insects.

1.4 Damage

1.4.1 Symptoms

Usually, ants are not directly responsible for damage to citrus trees or their crop, although *Myrmecaria natalensis* (Smith), a large brownish-red ant, has been known to damage new growth flush on young trees. Ant infestations may be noticed only after red scale, or a honeydew-producing insect, has reached high densities. Sooty mould is associated with honeydew production and may point to an ant problem.

1.4.2 Seasonal occurrence

Ants are most numerous from September to March but should be controlled all year. They usually present more of a problem during growth flushes when honeydew-producing insects are present.

2 MANAGEMENT ASPECTS

2.1 Infestation/damage assessment

Ant activity can be detrimental on both non-bearing and bearing trees.

2.1.1 Inspection

Tree trunks should be inspected for ant activity every two weeks between 09:00 and 11:00 on warm, sunny days. Ensure that any ant bands present are still effective.

2.1.2 Treatment threshold

If more than 30% of the trees in an orchard are infested with ants, then all trees in the orchard should be treated. Where less than 30% of the trees are infested, only those particular trees need to be treated.

2.2 Control options

2.2.1 Biological

Ants cannot be controlled biologically, but competition between different species sometimes prevents a major problem.

2.2.2 Cultural

Where ant control is effected with trunk treatments, trees should be skirt-pruned after harvest and weeds controlled so that the only access for ants to the tree canopy is via the trunk. The trees must be skirted high enough to prevent branches from touching the ground when they are weighed down with mature fruit.

2.2.3 Plant protection products

A few options containing plant protection products are registered for ant control. Some are designed to be applied to the tree trunk, while others need to be applied to the ground or around nest openings. In addition, certain options have an impact on ants of all sizes, while others are only effective against the smaller species. These factors are reflected in the following presentation of registered control options. In most cases the options involve highly concentrated solutions of proprietary products. Where this is a factor, usage needs to be well supervised and workers adequately protected. As mentioned previously, ants can be beneficial on the orchard floor so barriers that prevent ant access to trees are preferable to treatments that eliminate ants on the orchard floor.

2.2.3.1 Trunk treatments

(i) Mechanical barriers

Bands or collars made from various materials act as mechanical barriers. They may be used in conjunction with proprietary products where specified and are suitable for the control of all species of ants.

Polybutene sticky barrier

This barrier was previously known as “Ant Bar 1.2.3”. It consists of three layers:

- *Polyester fibre layer.* A band of polyester or

Bidim U24 (geotextile), 100 mm in width, is wrapped around the tree trunk as a single layer with a 20 to 30 mm overlap. If the trunk has crevices or small undulations, the back of the polyester fibre layer can be fluffed by hand. Where the trunk is severely fluted, the hollows must be filled with loose balls of the fibre.

- *Stretch-wrap plastic film layer (Gladwrap):* The polyester/Bidim fibre layer is held in position by two or three layers of Gladwrap so that 10 to 15 mm fibre is left exposed above and below the plastic wrapping. **This is important because the fluffy edges permit accumulated moisture to escape from beneath the Gladwrap.**
- *Outer sticky layer (Ant-Bar):* This layer is the sticky barrier that actually stops the ants from moving up the tree. It comprises a polybutene and wax compound that remains sticky for several months. The material is applied to the Gladwrap layer with a stout, flat, pointed stick. Ant-Bar is also manufactured in 280 g cartridges for use in a gun applicator. This is a quick, clean and efficient method of application. It is important to prevent the sticky Ant-Bar from making direct contact with the trunk surface in order to avoid damage that can result in ring-barking of young trees. It is sometimes necessary, especially in windy and dusty areas, to reactivate the sticky polybutene layer every few months by stirring it with a stick and removing leaves.
- The Gladwrap and Ant-bar must be replaced on an annual basis. On young, vigorously growing trees it is also necessary to loosen the polyester/Bidim layer to prevent restriction of trunk growth.

Grease band

This barrier is similar in principle to the above band and also incorporates three layers. However, it uses a grease-like paste rather than polybutene. **Severe phytotoxicity has been experienced with this band where the grease has made direct contact with the tree by one means or another and for this reason it is no longer available.**

Cap or collar barrier

This barrier was available under the proprietary name of “Protector”, sold by Myfo Manufacturing or the Sper ant barrier, but they may no longer be available. They are used in conjunction with a suitable insecticide such as Fastac and have two layers:

External protective polyethylene layer. This layer protects the barrier against wind, rain and sunlight.

Polyester fibre layer. The fibre layer is glued to the under-surface of the external plastic layer and serves as a mechanical barrier as well as a substrate for the special treatment registered for use with the barrier.

After the barrier has been placed in position the fibre layer on its underside must be soaked with one part Fastac in four parts water. This can most readily be done with a knapsack sprayer and a spray lance which has the nozzle mounted at a 90° angle to facilitate wetting of the fibres (care must be taken not to spray any foliage). The treatment must be reapplied when ants are observed crossing the barrier. This barrier is well suited to windy, dusty conditions and is effective against all problem ant species.

A particular Protector/Sper barrier can be used until trunk expansion requires that it be replaced with a larger size.

(ii) Trunk spray with a proprietary product

These treatments are suitable only for the control of **smaller ant species**. The treatments are applied as a coarse spray around the base of the trunk.

The following product is registered for use:

Product	Dosage/100 l water
Dursban WG	1,25 - 2,5 kg
Fipronil/lambda-cyhalothrin	250 ml

2.2.3.2 Soil or nest treatments

Apply only as a **spot treatment** to infested soil

at the base of the tree and to nest openings. For environmental reasons, cover sprays to the soil over large areas should be avoided. These treatments are the only effective chemical treatments for the pugnacious ant but are more effective against the smaller species.

Product	Dosage/100 l water or as indicated
Malathion EC	4 l
Malathion WP	8 kg

The following bait treatment is only recommended for the control of the brown house ant:

Product	Dosage
Siege bait	10 g/tree (scatter granules around tree base if more than 5 ants per min, follow up if necessary with 7 g/tree)