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WHITE WAX SCALE: A PEST OF CITRUS

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INTRODUCTION

In the highlands if a citrus tree is examined a number of small white spots of wax can often be found. The leaves, stems and fruit of these trees are usually covered with a black 'deposit'.

The white spots are insects called white wax scales, *Gascardia destructor.* These scales feed by sucking the sap from the plants through special mouthparts which are pushed into the plant stem. The black 'deposit' is a fungus called sooty mould. This lives on a sweet sticky substance called honey dew which is produced by the white wax scales.

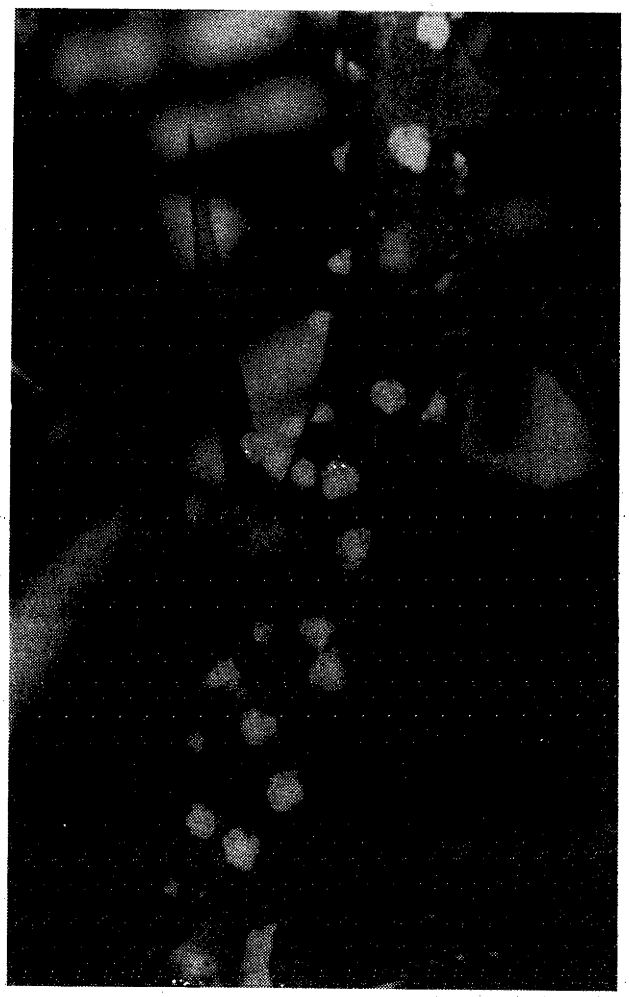
DESCRIPTION

All the white wax scales found on a citrus plant are females. The waxy covering of the adult female is irregular in shape and is up to about 9 mm across and 6 mm high. This waxy covering is for protection against enemies. The white wax scale's mouthparts are pushed into the plant and because it has a continuous supply of food it does not need to move. The adult scale therefore has no legs or wings.

The adult males of most scales are small insects with wings, completely different to the adult females. However in the case of the white wax scale, adult males are unknown.

BIOLOGY

Mature females of the white wax scale lay up to 1000 eggs and then die. The eggs remain under the scale's waxy coat until they hatch into small crawlers. The crawlers have 6 legs, like other insects. They move from the twigs to the leaves where they attach themselves to the midrib and feed on the sap through their piercing mouthparts. They produce about 13 strands of wax from their backs which gives them a star-like appearance.



A citrus branch infested with white wax scale.

The crawlers stay on the leaves for a few weeks until they have grown enough for their first moult (change of skin). They then move back to the twigs where they settle and push their mouthparts into the plant to suck the sap. They then lose their legs. They grow and change their skins several times until they are adult females, ready to lay eggs and start the cycle again. Adult males are not known and the females can lay eggs without mating.

When the scale insects feed they take into their bodies large amounts of sap from the plant. From this they take their food. However there is usually too much sugar and this is excreted in large quantities as a substance called honeydew. The honeydew covers the leaves, stems and fruit, and provides a food for a black fungus, called sooty mould, which grows on it. So plants which have very large numbers of white wax scales on them often have a large number of their leaves and fruit blackened by this fungus.

ECONOMIC IMPORTANCE

The white wax scale attacks a range of plants including citrus, avocado, guava, coffee, tea, gardenia and some bush plants. On some plants, such as citrus and gardenia, the numbers of the scales are often high. On others, such as tea and coffee, scales are rare.

The white wax scale causes damage to citrus in two ways. Firstly large numbers of scales can remove so much sap from the plant that the plant does not grow so well, and the yield of the crop is reduced.

Secondly the sooty mould, which grows on the honeydew produced by the scales, coats the leaves and so reduces the amount of sunlight that reaches them. Green plants make their food through a process called photosynthesis. This process can only occur in sunlight. By reducing the amount of sunlight reaching the leaves, the sooty mould also reduces the amount of food the leaves can make. This slows down the growth of the plant. Also the sooty mould growing on the fruit makes it look unsightly and reduces its value unless it is washed before it is sold.

CONTROL

Biological

In Papua New Guinea several predators feed on white wax scales, e.g. predatory ladybirds. However these predators do not reduce the numbers of scales enough to reduce the damage which they cause. In parts of Africa the scale insect is only present in low numbers on citrus and studies by entomologists have shown that this is because several species of parasites keep it under control. These parasites are mainly tiny wasps. They insert their eggs into the scales and their young stages live inside the scales. The parasite larvae eventually kill the scales when they themselves are fully grown and ready to change into adult parasites.

Three of these parasites have been introduced into Australia. One of these, *Paraceraptrocerus nyasicus*, gave very good control of the white wax scale in Queensland, and at the end of 1981 this species was imported into Papua New Guinea.

The parasite has given very good control of the white wax scale in the sites at which it has been released in Papua New Guinea. It is gradually spreading from these sites.

Chemical

Control by spraying with insecticides is difficult. In particular the mature scales are very hard to kill with insecticides because of the protective waxy coat.

FURTHER READING

Hassan, E. (1977). *Major Insect and Mite Pests of Australian Crops.* Ento. Press: Gatton, Queensland. 238 pp.

FURTHER INFORMATION

For further information about white wax scale, contact your nearest D.P.I. entomologist. Entomologists are based at:

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