

A SICKNESS OF COCONUTS CAUSED BY A LEAFHOPPER

By E.S.C. Smith, Senior Entomologist,
Lowlands Agricultural Experiment Station, Keravat, E.N.B.P.

INTRODUCTION

During the early 1960s many coconut palms in the Finschhafen area of Morobe Province became affected by an unknown sickness. Affected fronds of the palms turned yellow, and in severe cases young palms died. The sickness was linked to the sucking bug *Zophiuma lobulata*.

SIGNS OF DAMAGE

Unhealthy palms were first noticed near Finschhafen in 1960, but the problem was not thought to be very serious. However, in 1965 many older palms began to die and the condition spread to other areas. In the area where it was first noticed, up to 10% of older palms died as a result of the sickness and at least 80% of all palms showed symptoms (signs).

The early stages of the sickness are difficult to recognise. They may be confused with normal yellowing of fronds due to extreme weather conditions, shortage of certain nutrients (plant foods), insect damage, or other reasons. Within several months however, the palm appears to be ageing very quickly.

First, leaflets become yellow at the tip and then the yellowing advances towards the trunk.

This yellowing spreads much more rapidly at the tips of the fronds than in the area near the trunk. The leaflet tips die and the dead area spreads gradually until all the yellow area is dead. The signs are most evident in lower fronds, but later extend upwards to the younger ones.

In severe cases the stalk of the frond bends where it grows out from the trunk. This causes an affected frond to droop much more than a healthy one. The lower fronds die earlier than normal and dead fronds often stay hanging from the palm crown. There is a big decrease in nut production as the problem gets worse.

Palms which have recovered from an attack have a large amount of dead tissue on otherwise healthy fronds.

LINKS BETWEEN THE SICKNESS AND LEAFHOPPERS

1. In the Finschhafen area, leafhoppers were found in large numbers on affected palms but only in small numbers on healthy ones.
2. Both nymphs (immature bugs) and adult bugs fed on the fronds and were found mostly on the oldest frond of the palm. Sometimes large numbers of insects



The young coconut palms on the left were kept with the leafhopper, and those on the right without. The palms on the right are growing much more strongly.

were noticed in unaffected areas several months before the sickness appeared. More than 1000 insects per frond have occasionally been recorded.

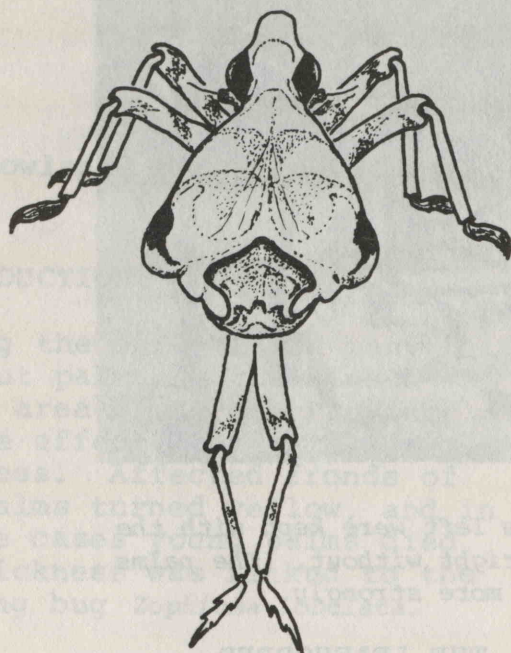
3. When a badly affected young palm was taken from Finschhafen to Port Moresby and grown in its own soil without any leafhoppers, all the newly emerging fronds were perfectly healthy.
4. Leafhoppers kept with potted coconut seedlings at Popondetta, developed similar symptoms to those at Finschhafen in 6-7 months. After 14-15 months the coconuts were very stunted, many fronds had died and the palms looked very sick. All the fronds had turned dark yellow. However, other seedlings planted at the same time and kept without leafhoppers were growing strongly and all had dark green fronds. These palms were almost twice the height of those which were kept with leafhoppers.

THE LEAFHOPPER

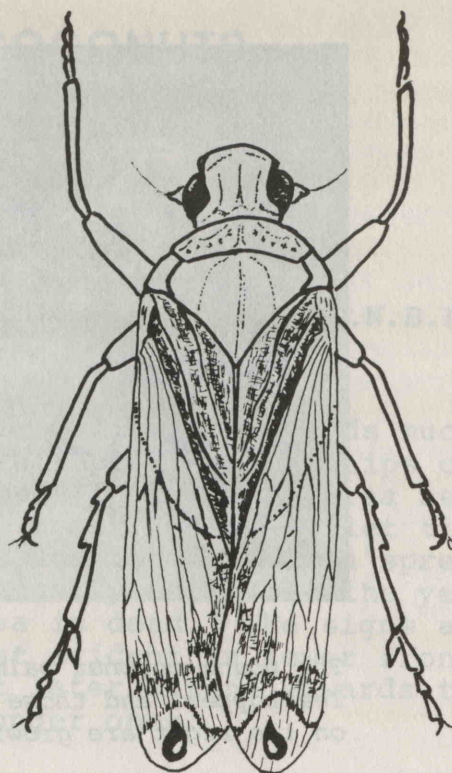
Adult leafhoppers are brown and 16-18 mm in length. They have a black spot near the tip of their wings. Eggs are laid in batches of 35-40, usually on the fibrous material of the trunk or on the lower surfaces of leaflets. The eggs, covered by a white woolly secretion, are pale green and about 2 mm long and 1 mm wide. They are frequently heavily parasitised by a small wasp. There are five nymphal stages. Each of these has two very long waxy threads sticking from its body.

The life cycle of the bug is about 4 months, of which 8-9 days are in the egg stage, about 12 weeks in the nymphal stages and four weeks as adults before eggs are laid.

Although this leafhopper occurs on coconuts along the North Coast from Alotau to Finschhafen, the sickness has been seen only in the Finschhafen and Popondetta areas. Leafhoppers are also known to feed on betelnut, pandanus and granadilla.



2 mm



1 cm

The leafhopper, *Zophiuma lobulata*. The youngest stage is shown on the left, and the adult on the right.



A coconut palm suffering from the sickness at Finschhafen. The frond marked with an arrow shows clearly the dark area at the centre, where the leaflets are still green. The lighter area is the part of the frond which has turned yellow.

CONTROL OF THE LEAFHOPPER

Effective controls for many coconut pests are often not economic since the crop has a relatively low value per hectare. Insecticide treatments, either applied as sprays or as trunk injections would almost certainly be effective, but the high costs involved would probably prevent treatment except in very damaging attacks or in a small outbreak area.

Attempts at biological control may prove successful and are preferable. It may be possible

to collect parasitised leafhopper egg masses from 'non-outbreak' areas and release the emerging parasites in badly affected coconut blocks elsewhere. Other parasites could also be introduced.

FURTHER READING

Smith, E.S.C. (1981). *Zophiuma lobulata* Ghauri (Homoptera: Lophopidae) and its relation to the Finschhafen coconut disorder in Papua New Guinea. *Papua New Guinea Agricultural Journal* (in press).