



## Pacific Pests, Pathogens & Weeds - Fact Sheets

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### Coconut Finschhafen disorder (280)



Photo 1. Symptoms of Finschhafen disorder on an oil palm leaf.



Photo 2. Adult planthopper *Zophiuma butawengi*: side view.



Photo 3. Adult planthopper, *Zophiuma butawengi*, showing the characteristic patterns on the wings.



Map. Locations in Papua New Guinea where there have been outbreaks of the Finschhafen disorder.

#### Common Name

Finschhafen disorder

#### Scientific Name

The disorder is caused by the feeding of the leafhopper, *Zophiuma butawengi* (previously *Zophiuma lobulata*).

#### Distribution

Narrow; reported only from Papua New Guinea in coastal areas in Morobe to Milne Bay Provinces, and in west New Britain (Map). Outbreaks were first reported on coconut in 1960 near Finschhafen, and subsequently it was seen at Popondetta, and on Losuia island. In 1994, the disorder appeared in villages of west New Britain, and in adjacent oil palms; in 1998 it reappeared affecting both coconuts and oil palms over a very large area of New Britain. It now occurs widely on oil palm on that island and also on mainland Papua New Guinea.

#### Hosts

Coconuts, oil palm and betel nut.

#### Symptoms & Life Cycle

Finschhafen disorder causes early ageing of the leaves or fronds of coconut and oil palm. The leaflets become yellow-bronze starting at the tip and progressing back to the petiole or leaf stalk (Photo 1). This change to yellow-bronze is more pronounced in the leaflets near the tip of the leaf; here, the colour change is throughout the leaflet. As the colour change advances along the frond, the leaflets at the furthest end start to die from the tips.

The older fronds show symptoms first, with the disorder gradually spreading upwards. In severe cases, the fronds bend down more than is usual for those that are healthy, and they die prematurely. In coconut, nut production is low.

The disorder is due to the feeding of the planthopper, *Zophiuma butawengi*. It is not due to phytoplasmas or bacteria-like organisms. It affects both young and old coconuts and oil palms, and when leafhopper numbers are high (100 per frond) symptoms occur within 3 to 12 months. Furthermore, the disorder does not spread within the palms, i.e., it is not systemic. Symptoms on one frond do not lead to their occurrence on others. Spread within plantations is slow and patchy.

The reason for the yellowing is unknown. It may be caused by the planthoppers damaging the cells as they feed or their saliva is toxic.

Eggs, covered in a white woolly substance, are laid at the base of the petiole or on the lower surfaces of the leaflets. There are five nymph stages, lasting about 12 weeks. Adults are 16-18 mm, brownish, with a black spot enclosing a white spot at the end of the wings (Photos 2&3). Spread occurs by flight, and probably over long distances on the wind.

## Impact

In outbreak areas, losses may be a third of the crop, with 80% of the palms affected and 10% dead. In severe cases, where 80-90% yellowing occurred and the fronds died, coconut palms drop their nuts. Although losses in oil palm have not been estimated, the disorder is considered a threat to production in Papua New Guinea, with some outbreaks in Milne Bay and the Northern Province exceeding 100 ha.

## Detection & inspection

Look for lower leaves that are ageing faster than normal, becoming yellow-bronze from the ends of the leaflets towards the midrib, especially at the tips of the fronds. Look for large planthoppers, 16-18 mm long, feeding on the yellowing leaflets. Look for the distinctive spots at the end of their forewings.

## Management

### NATURAL ENEMIES

Natural enemies of *Zophiuma butawengi* include generalist predators and wasp egg parasitoids. Field surveys showed that *Parastethynium maxwelli* and *Ooencyrtus isabellae* parasitise about 25% and 75% of the egg masses, respectively. The fungus, *Metarhizium flavoviride* var. *minus* was found on *Zophiuma butaengi* in New Britain.

### RESISTANCE VARIETIES

There is no information of differences in tolerance to the disorder in either coconut or oil palm.

### CHEMICAL CONTROL

Systemic insecticides have been used to contain outbreaks of the leafhopper in oil palm when pest injury was considered to be above economic injury levels. However, the organophosphate insecticide used (methamidophos) is considered highly hazardous by the WHO, and is no longer used in Europe, the United States of America or Australia. It is likely that synthetic pyrethroids would be as effective.

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Information from Gitau CW, *et al.* (2011) *Zophiuma lobulata* (Hemiptera: Lophopidae) causes Finschhafen disorder of coconut and oil palms. *Annals of Applied Biology* 158:139-148. Map Woruba DN, *et al.* (2014) Entomopathogenic fungi of the oil palm, *Zophiuma butawengi* (Fulgoroidea: Lophopidae), and potential for use as biological control agents. *Austral Entomology* 53:268-274. Photos 1-3 Ken Walker (2011) Lophopid Planthopper (*Zophiuma butawengi*). (PaDIL - (<http://www.padil.gov.au>).

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