

BAGWORMS (LEPIDOPTERA: PSYCHIDAE) AS PESTS OF OIL PALM IN PAPUA NEW GUINEA

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Introduction

There are many different species of bagworms in Papua New Guinea (PNG) and worldwide; three are currently of economic importance to oil palm in PNG (Figs.1 & 2). Examples of these insects may be seen in the wooden pest display boxes and the posters that are available. Both training aids should be displayed in all plantation and smallholder extension offices.

Biology

All stages (including the eggs) are only seen as bags hanging from the underside of fronds made from fragments of leaf and silk (Fig. 3); sometimes bags are found on the upper surface of a leaflet. Inside the bags are the eggs, larvae, pupae or adult females at various stages of development. Males pupae are extruded from the bag emerge from the pupae, and when the males emerge they only fly at night. Males have a very short life of sometimes only one day, as they cannot feed. Males are rarely seen except by expert eyes! Females have no wings and never leave the bags. They die after mating and egg-laying. Females lay large numbers of eggs which remain in the bags until the young larvae (caterpillars) hatch. When the larvae hatch, they spin long silken threads and as they leave the bag they are dispersed by being blown around by the wind. This is one of the reasons why infestations occur along the edges of roads or harvest paths. The dry season is often the time they become a problem causing damage to the palms, however they may also be found during wet periods.



Figure 2: Ice-cream cone bagworm (*Manatha conglacia*)
Scale bar = 5mm.

Food plants and Damage

Bagworms feed on a variety of plants. Palms of all ages may be attacked, however the damage to leaflets caused by the different bagworm species is very characteristic, and looks like gunshot pellet holes where the larvae have chewed through the leaf tissue, or where the leaf layers have been eaten away and the dry (pale coloured) centre falls out (Fig.4). Damage is usually seen on the leaflets of middle and lower fronds. If damage is seen higher up in the palms, then the infestation is likely to require treatment.



Figure 1: [R], Rough (*Mahasena corbeti*) & (L), Smooth (*Eumeta variegata*) bagworms. Scale bar = 5mm.



Figure 3: Rough bagworm bag hanging beneath a leaflet. Scale bar = 5mm.



Figure 4. Typical shot hole-like damage caused by young *Mahasena corbetti* larvae.

Control

Bagworms are often heavily parasitized by Diptera: Tachinidae ("parasitic flies"), Hymenoptera: Chalcididae ("parasitic wasps") and fungi that kill insects, and infestations often die out naturally. Current recommendations for the control of bagworms are by hand picking of the bags from smaller palms. In the case of heavy infestations, or for taller palms, control is by undertaking Targeted Trunk Injection (TTI), as is used for other oil palm pests. Other options are currently being investigated. Please see comments below regarding authority to undertake TTI.

When hand picking is done, ALL samples collected should be sent to Dami (PNGOPRA), where we will rear out any parasitoids for release back into the field, to encourage biological control.

Sanitation

This process is essential for the management of bagworms, as they typically attack the lower fronds which may be removed during harvest. Bags on those fronds will die in the frond piles. Encouraging the planting of plants beneficial to parasitoids and predators is particularly important in bio-control of bagworms as their common parasitoids rely on plant nectar as a food source and habitat for the adult stages of their life cycle.

Importance of Surveys

Regular surveys for the presence of all pests and rapid reporting are important to enable managers to know when to request a Pest Visit report from PNGOPRA. As a guide, if fronds are damaged above a horizontal mid-line (remembering bunches push fronds downwards), then a Pest Visit Request Form should be submitted to PNGOPRA Entomology by **email** (details provided), as damage is now threatening. Regular surveying of plantations for pest presence is very important and any concerns about possible pest activity should be rapidly transmitted to PNGOPRA. During surveys any samples of bagworms should be collected and sent to PNGOPRA for any follow

up that may be required. Samples collected should **not** be sent in plastic bags as the insects will die very quickly. On request, PNGOPRA will provide special 'breathable' white bags(*). If pests are suspected then a visit request should be emailed through to PNGOPRA (the address is given below) for advice.

Label information required is:

1. Locality where the sample was collected, Plantation, Division, MU, Section or Block?
2. Host plant: from what host plant were samples collected?
3. Date of collection
4. Who made the collection

Authority to undertake oil palm treatment (TTI)—an important reminder

Plantations or Smallholder treatment team considering to undertake TTI with Methamidophos is reminded that this is not permitted by the PNG Department of Environment and Conservation (DEC) without written authority from PNGOPRA (Head of Entomology). Permission is granted through the possession of a signed Pest Recommendation form. Treatment teams are expected to received regular training in operational and Health and safety procedures.

For further information contact:

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