COCOA WEBWORM: A PEST OF YOUNG COCOA TREES

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DISTRIBUTION OF COCOA WEBWORM IN PAPUA NEW GUINEA

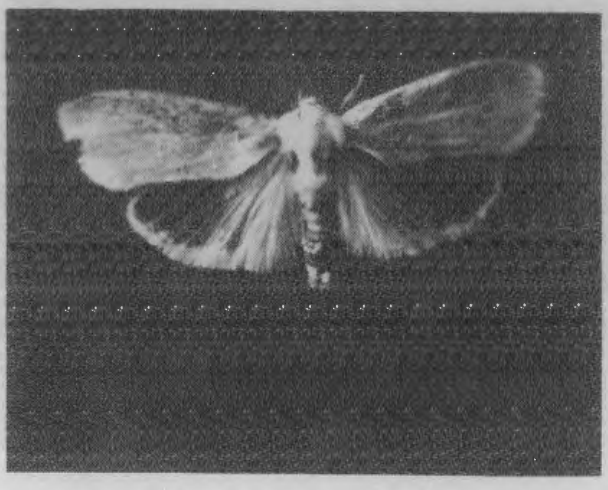
Cocoa webworm (or *Pansepta*) is found in cocoa plantings on the Papua New Guinea mainland, New Britain and New Ireland. It has not been found in North Solomons Province. On the mainland it occurs at Aitape, Madang, Lae and Popondetta, and also in Irian Jaya. On New Britain it occurs throughout the Gazelle Peninsula, along the Bainings coast, and at Bialla and Garua Island. It has not yet been found on the west coast of New Britain. On New Ireland, it has been found on some plantations north of Namatanai.

HOST PLANTS

Cocoa webworm is native to Papua New Guinea, where it occurs naturally on some native trees, such as casuarina and mangas. It now eats a number of introduced trees, including cocoa.

LIFE HISTORY

The adult cocoa webworm is a small shining white moth, about 10 mm long. The moth lives for only about three days, and eats nothing during this time. The adult lays pink coloured eggs singly along the branch of a cocoa tree.



The moth stage of cocoa webworm. This stage is rarely seen. The moth lives for about 3 days

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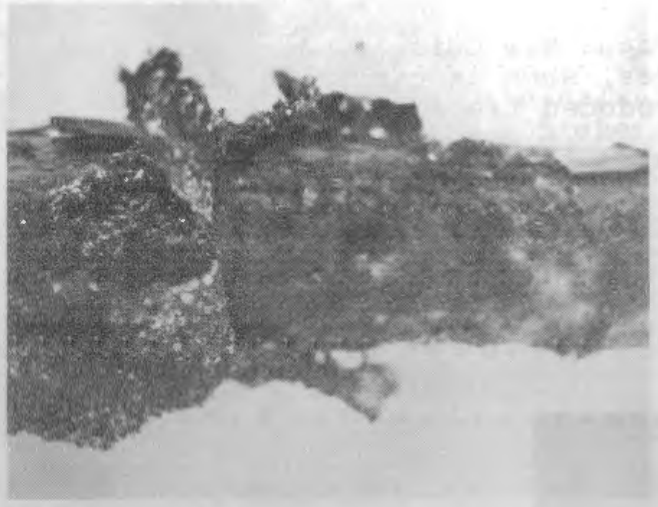
After 3-5 days the egg hatches, and a very small larva (caterpillar) emerges. This larva spends some time crawling along the cocoa branch in search of a place to channel into the wood. It is during this time that the larvae is most likely to be killed by natural enemies, such as ants. Between 60% and 95% of young larvae die before they find a suitable place to bore into the branch.

When the young larva finds a good place for a channel, usually at a leaf scar, it chews into the bark to make a surface channel. The larva then covers this channel with a silk web, in which are entwined small brown droppings called 'frass'. As the larva grows, it bores into the middle of the branch. The channel protects the larva from enemies. The larva is very difficult to kill once inside its channel. The larva comes out to feed on the bark surrounding the entrance to the channel and this surface feeding area is covered with frass. The larval stage lasts between 8 and 12 weeks.



Web of frass removed to show the feeding area and the entrance to the larval channel.

When the larva grows to full size(about 30 mm long) it forms a brown case around itself, and does not move. The insect is now in the pupal stage, which lasts 3 to 4 weeks. At the end of this time the adult moth emerges from the pupal case and crawls out of the channel. The adult flies a short distance, mates, and the female lays eggs which are the start of a new generation.

GENERATIONS

The stage of the cocoa webworm which damages the tree is the larval stage. This stage is not found in all moths throughout the year. Instead, larvae occur in distinct generations. There are on average between 2.5 and 3 generations of larvae in each year. These generations result in 'peaks' of webworm numbers in some months of the year. Unfortunately, these peaks do not always occur in the same months every year.

In the field, the end of a generation can be roughly judged to be when many pupae are found in the channels. From this time, the next peak in webworm numbers can be expected to occur in 8-12 weeks.

Branch cut open to show a fully grown larva

Branch cut open to show pupal stage

Webworm channels in the jorquette of young cocoa trees may seriously retard the growth of the young tree

Web made by webworm larvae to cover the entrance to their channels

DAMAGE

Damage is caused by larvae eating the bark around the channel. Where a number of larvae live on the same branch, that branch may be effectively ring-barked; growth will then be restricted, and in some cases the branch may die.

When webworm attacks young cocoa (up to about four years old), severe damage may be caused by channels in the main trunk, the jorquette and the fan branches. In some cases the tree may die.

It is difficult to measure webworm damage to mature trees. Some trees can loose a lot of leaves but still produce a good crop. Just because webworms are found in the tree it does not mean that they are doing serious damage. Control is needed only if branches are being killed by the webworm.

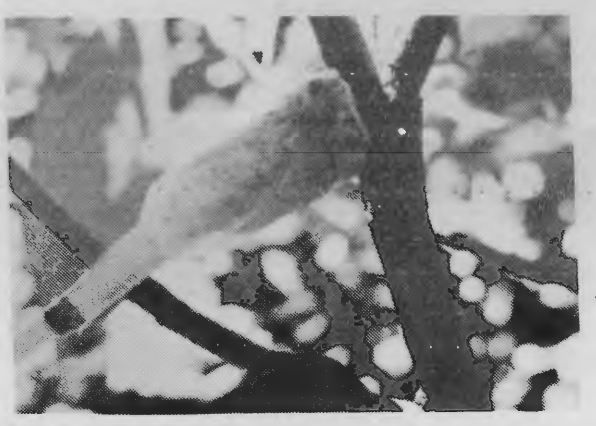
CONTROL

If control is necessary, it should be aimed at killing the young larvae in the channels. Cutting out affected branches is not recommended, because severe pruning may weaken the tree and so expose it to further insect attack. Further, there is little hope of cutting out all the webworm in a tree since some eggs and young larvae are likely to be missed.

The only recommended means of control is to remove the frass and paint the feeding area with an insecticide solution. The larva feeds on the treated area, eats the insecticide, and dies.

Dimethoate (Rogor^{R}) applied as a 0.3% solution is recommended for control of webworm. It is effective in killing webworm larvae, and it is less harmful to users than a number of other insecticides. To apply the insecticide, a swab is made by securely tying an absorbent pad of cloth to the end of a stick. The pad is dipped into the insecticide solution and applied to the feeding area.

A young cocoa tree with web along the fan branches



Larvae in the wood may be controlled by swabbing the feeding area with insecticide

Insecticide treatment is usually only necessary in young trees where the canopy has not yet closed (the branches of neighbouring trees have not grown together).

Another method of control is to increase the shading over the cocoa trees.