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HELIOTHIS CATERPILLARS - A PEST OF SORGHUM

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INTRODUCTION

Caterpillars of *Heliothis armiger* are serious pests of a wide range of crops in Papua New Guinea. This bulletin deals with them as a pest of sorghum. On this crop they are sometimes called sorghum caterpillars. Damage to other crops is dealt with in Entomology Bulletin No. 34.

DESCRIPTION

Fully grown heliothis caterpillars can be almost black, brown, green, light brown or pink. There are 3 dark lines along the body: one along the back and the other two along the sides. The darker lines are separated by broader pale bands. These are shown in the pictures below.

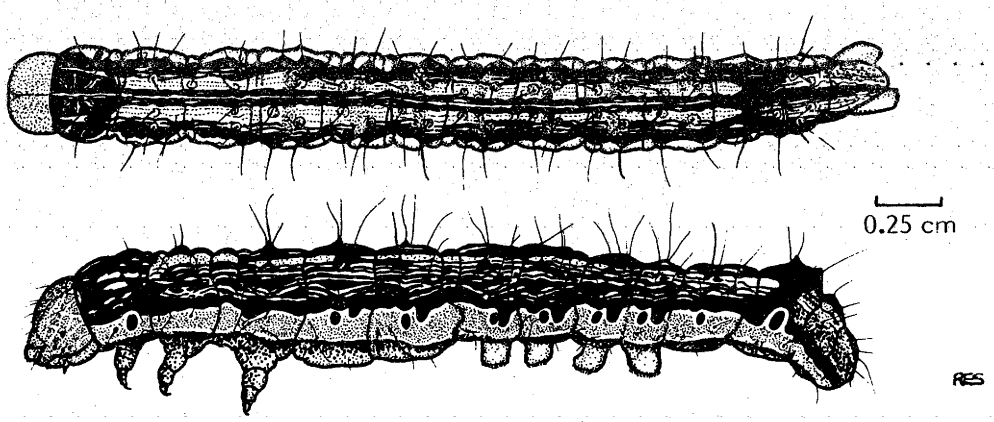
BIOLOGY

The female moths lay their eggs at night, singly, on the leaves, shoots or flower buds of the host plants. The eggs are shiny-white at first, changing to light greenish-yellow. They are dome shaped and ribbed.

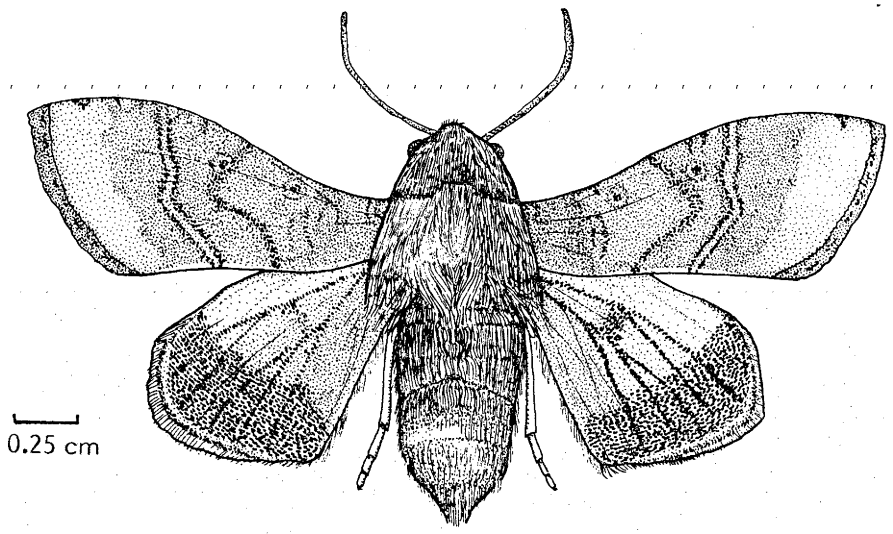
After they hatch, the small heliothis caterpillars first eat their egg shells. They then start to feed on various parts of the host plant. As they grow they moult (change their skins) four or five times. Fully grown caterpillars are about 4 cm long.

The fully grown heliothis caterpillars then burrow into the soil where they pupate (enter the resting stage). The adult moths emerging from the pupae have stout bodies, yellowish-grey to orange or reddish-brown forewings marked with fine dark wavy lines, and pale brown hindwings with a darker border. The wing span is about 3.5 cm. The adults are nocturnal (active during the night) and are not often seen during the day.

The length of the life cycle varies according to temperature. In the Lae area heliothis eggs hatch in 3-4 days, the caterpillar stage lasts 23-25 days and the pupal stage 14-17 days. In the highlands the length of these stages is longer.



A fully grown heliothis caterpillar, viewed from the top and the side to show the pattern of dark and pale bands (About 3 times natural size.)



Heliothis armiger - *the adult moth (About 3 times natural size)*

ECONOMIC IMPORTANCE

Egg laying begins when the sorghum heads are fully emerged and reaches a peak at the yellow flower stage. The young larvae first feed on the flowers and unopened leaves and then later on the developing sorghum grains. The plants can tolerate some damage to leaves at the early stage of growth. However damage to the grain can be serious if many caterpillars are present. A large reduction in both yield and quality often results. The partially eaten grains also become infested with fungus and other insects. In areas where humidity is high, sorghum heads often become completely covered with mould.

CONTROL

The recommended insecticide for the control of heliothis caterpillars on sorghum is acephate. This is sprayed at a concentration of 0.1%.

To obtain this concentration mix together:

13 g Orthene 75% SP
10 litres water
Wetting agent at rate specified

There are two different ways that control can be obtained with this insecticide:

1. The crop can be sprayed immediately after flowering has finished. At this stage egg laying should have been completed and the young larvae will have hatched. Control should therefore be obtained with one spray only.

2. The second method uses a scouting system to decide if control is necessary. A spray is applied only if the heliothis caterpillars are present at, or above, a certain number per sorghum head. If this method is used, the insecticide is sprayed only when damage is likely to result and you will save money by not having to apply insecticide to all your sorghum crops.

The scouting system consists of inspecting the sorghum heads at flowering and then each week for a further three weeks. Count the number of heliothis caterpillars using one of the following methods:

1. Inspect several sorghum heads selected randomly in several parts of the crop. Count the number of heliothis caterpillars; and note their size.

2. Take at least four samples of 20 heads, selected at random from four different sites in the block. Shake the heads into a bucket or plastic bag so that the heliothis caterpillars fall off. Alternatively, hold the stems of the sorghum heads between the palms of your hands, then rub your hands together to spin the heliothis caterpillars off of the heads. Count the number of heliothis caterpillars and note their size. Divide the total number of caterpillars by the number of heads sampled to give the number of caterpillars per head.

When carrying out the inspection you should also note whether the larvae appear healthy (i.e. are moving about and feeding on the plant normally) or whether they are sick (i.e. moving slowly, not feeding, look abnormal). If they do look sick they are probably infected with a fungal disease. If this is so they will die and there is no need to spray them.

After the inspection you should know the number of heliothis caterpillars per head, how big they are, and whether they are healthy or sick. You can now decide whether you need to spray. This should be done if there are more than three healthy caterpillars, more than 1.5 cm long, per head of sorghum.

For further details on the mixing and spraying of insecticides you should consult Rural Development Handbook No. 18, 'The Safe and Efficient Use of Pesticides' by J.A. Sutherland. This is available from D.P.I. Publications Section (address below).

FURTHER READING

Anon. (1976). Heliothis caterpillars. *Entomology Branch Insect Pest Bulletin* 26. New South Wales Department of Agriculture.

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Twine, P.H., Kay, I.R. and Llyod, R.J. (1983). Heliothis in sorghum. *Queensland Agricultural Journal 109* (4): 185-188.

FURTHER INFORMATION

Further information on Heliothis caterpillars can be obtained by contacting the D.P.I. entomologist or didiman nearest to you. Entomologists are based at:

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KIMBE
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