ENTOMOLOGY BULLETIN: NO.8 (Revised)
CONTROL OF DIAMOND-BACK MOTH IN BRASSICAS

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INTRODUCTION

The diamond-back moth, *Plutella xylostella*, is the most serious pest of brassicas (plants of the cabbage family) in Papua New Guinea. The young stages (larvae) feed on the leaves of various kinds of brassica, such as cabbage, Chinese cabbage, cauliflower and Brussels sprouts, often causing severe damage. To grow these crops successfully it is usually necessary to use some form of control measure to kill this insect.

DESCRIPTION AND BIOLOGY

The adult moth is about 7 mm long and greyish brown in colour with lighter diamond shaped markings on the upper surface when the wings are closed. The eggs are very small and yellow in colour, turning blackish just before hatching. They are laid singly or in small groups along the veins on the underside of leaves, or on the stems.

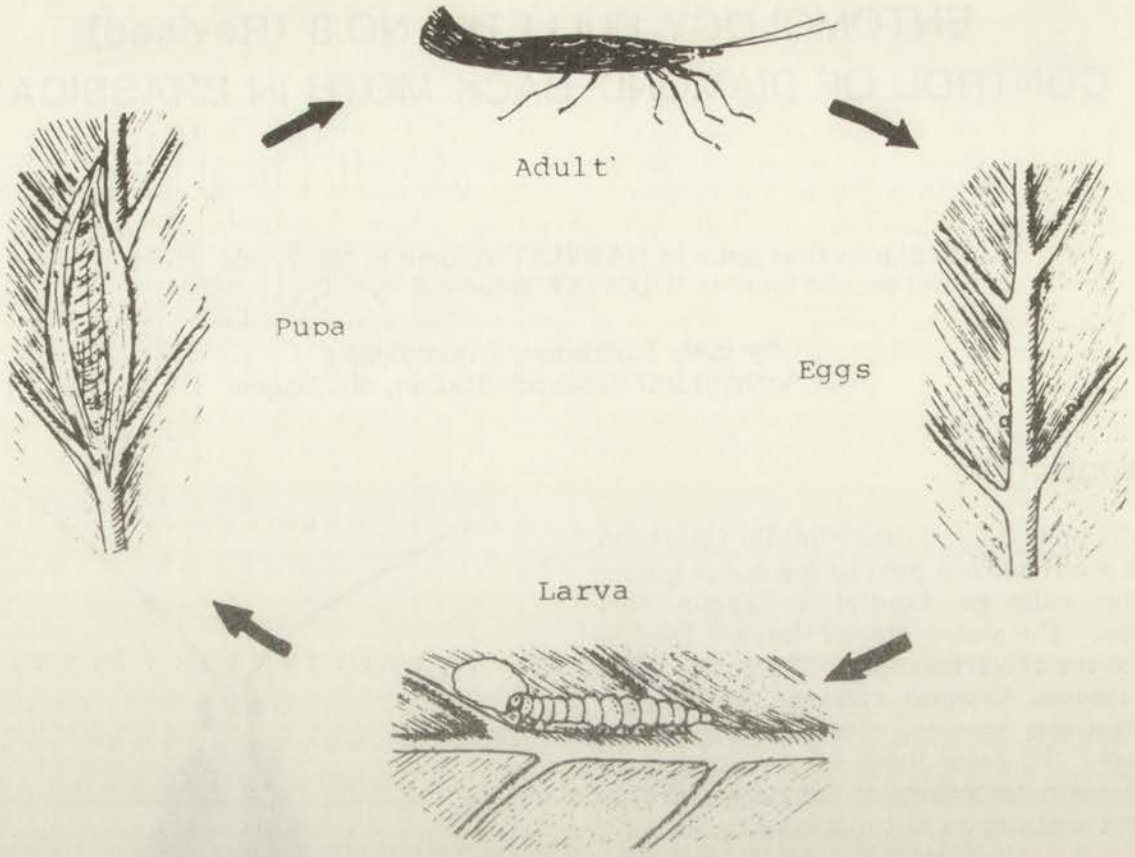
When the larvae hatch from the eggs they burrow into the leaves of the plant between the upper and lower epidermis (surface). Later, they emerge (come out) to feed on the underside of the leaf leaving holes of various sizes. The larvae are green and, when fully grown, are about 8 mm long. Pupation occurs on the plant in a silken cocoon.

In the Wahgi Valley, eggs hatch in three days, the larvae spend sixteen days feeding on the plant before pupating and the adult moths emerge from the pupae in another eight days. The time for one complete life cycle is therefore twenty-seven days. These times will vary depending on temperature, so that at low altitudes the life cycle will be shorter, and at higher altitudes, longer.

The diamond-back moth, shown ten times natural size.

ECONOMIC IMPORTANCE

The damage caused by the larvae feeding on the leaves is often very severe and in most areas good quality cabbages cannot be grown unless the insect is controlled with insecticides. The diamond-back moth is widespread and probably occurs in all areas of Papua New Guinea where cabbages and other brassicas are grown.



This diagram shows the life cycle of the diamond-back moth.

CONTROL

Chemical

At the present time chemical control is the only recommended method of control. Since the diamond-back moth has developed resistance to some chemicals in some areas of Papua New Guinea a range of recommendations is given below.

All these are based on experimental work carried out at Kuk Agricultural Research Station in the Western Highlands Province.

Damage caused by the diamond-back moth

In the lowlands, where population build-up is more rapid it may be necessary to spray more often.

All the insecticides listed in the table should be sprayed onto the plants at high volume (to run-off) making sure that both upper and lower surfaces of the leaves are thoroughly covered. A commercial brand of wetting agent should be added to the spray at the rate recommended on the container.

If you cannot obtain commercial wetting agents ordinary washing-up liquid may be used at the rate of 2.5 ml to 10 litres of insecticide mix.

In overseas countries many other insecticides are used for the control of diamond-back moth. Many of these are not suitable for use in Papua New Guinea because they are too poisonous to humans or because the chemical stays on the leaves of the cabbage for too long. Others have been tested and have not worked in Papua New Guinea. As new insecticides become available they will be tested and recommended in the future.

Table 1. Insecticides for the control of diamond-back moth

Common name	Trade name	Concentration to mix	Amount to mix per 10 litres of spray	How often to apply	Waiting period
Acephate	Orthene 75SP	0.05%	6.5 g	Weekly	3 days
Cypermethrin	Cymbush 25EC	0.0025%	1 ml	Weekly	7 days
Deltamethrin	Decis 2.5EC	0.00075%	3 ml	Weekly	3 days
Naled	Dibrom 90EC	0.05%	5.5 ml	Weekly	3 days
Permethrin	Ambush 10	0.00125%	1.25 ml	Weekly	None
Permethrin	Ambush 50	0.00125%	0.25 ml	Weekly	None
Permethrin	Ambush 10	0.005%	5 ml	3 weekly	None
Permethrin	Ambush 50	0.005%	1 ml	3 weekly	None
Pirimiphos-methyl	Actellic 50EC	0.1%	20 ml	Weekly	3 days
Profenofos	Selecron 500EC	0.05%	10 ml	Weekly	14 days
Tetrachlor-vinphos	Gardona 50WP	0.05%	10 g	Weekly	3 days

Good hygeine should be practised in all cabbage plantings. Once the heads have been harvested the remains of the plants should be destroyed to prevent the build-up of populations of insect pests.

Biological

A small parasitic wasp *(Apanteles plutellae)* was introduced into PNG in 1982-3 to try to control the pest biologically. It has not given adequate control and chemical sprays are still necessary. There are plans to introduce another parasite *(Diadegma eucerophaga)* which has given good control overseas.

FURTHER READING

Jones, F.G.W. and Jones, M.G. (1966). Pests of Field Crops. Edward Arnold: London. 406 pp.

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Metcalf, C.L. and Flint, W.P. (1962). Destructive and Useful Insects, Their Habits and Control. McGraw-Hill: New York, San Francisco, Toronto and London. 1087 pp.

Swaine, G. (1971). Agricultural Zoology in Fiji. H.M.S.O: London. 424 pp.

FURTHER INFORMATION

For further information about diamond-back moths and their control, contact your nearest D.P.I. entomologist or didiman. Entomologists are based at:

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