ENTOMOLOGY BULLETIN: NO. 8 (REVISED)

CONTROL OF DIAMOND-BACK MOTHS IN BRASSICAS

(Replaces first issue in HARVEST Volume 6, No. 2, pp. 91-93)

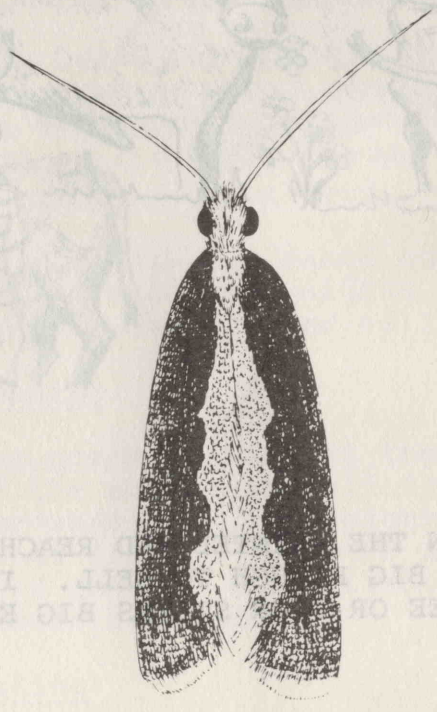
By B.M. Thistleton, Entomologist
Kuk Agricultural Research Station, Mt. Hagen

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

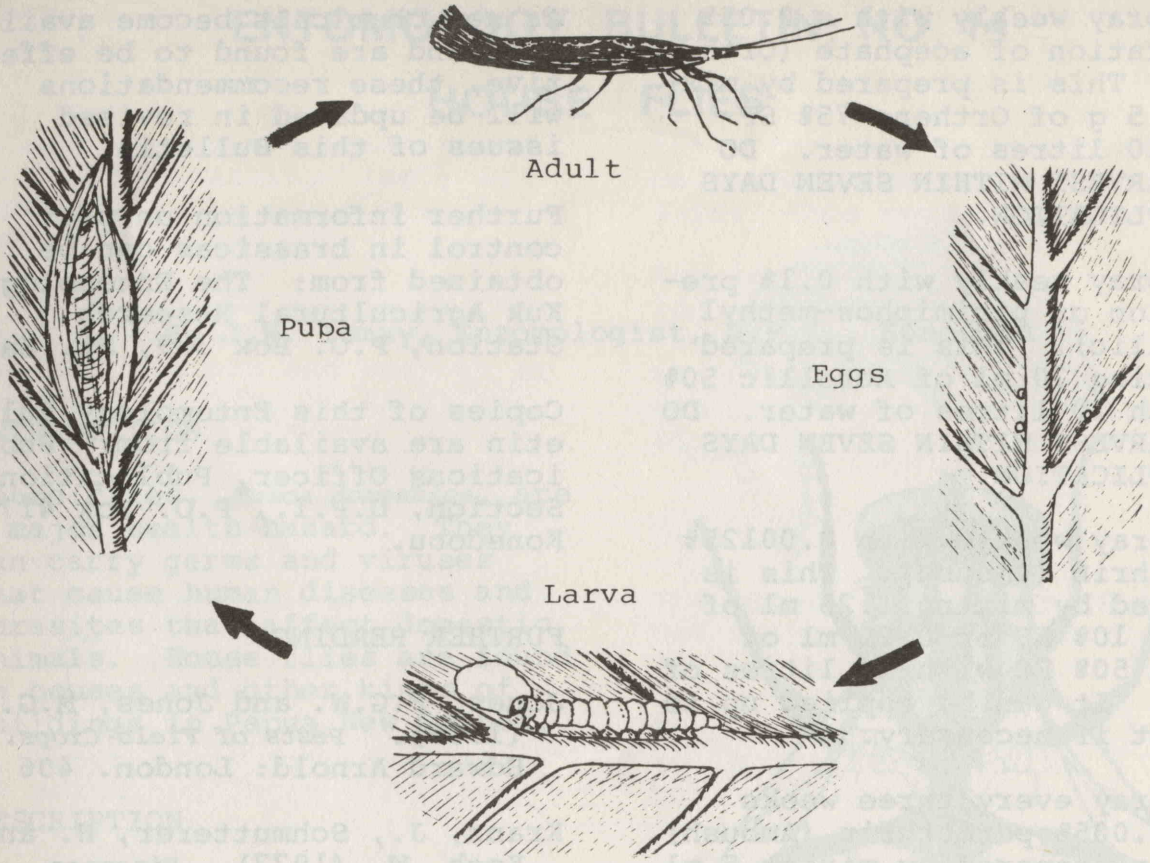
The adult moth is about 7 mm long and greyish brown in colour with lighter diamond shaped markings on the upper surface when the wings are closed. The eggs are very small and yellow in colour, turning blackish just before hatching. They are laid singly or in small groups along the veins on the underside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



The Diamond-back moth, shown ten times natural size

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.

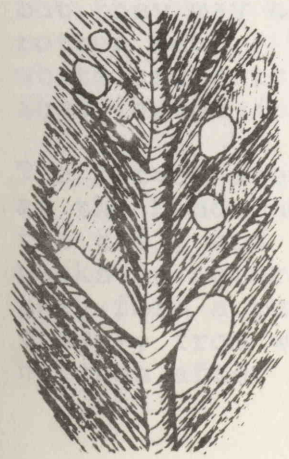
In the Wahgi Valley, eggs hatch in three days, the larvae spend sixteen days feeding on the plant before pupating and the adult moths emerge from the pupae in another eight days. The time for one complete life cycle is therefore twenty-seven days. These times will vary depending on temperature, so that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



This diagram shows the life cycle of the Diamond-back moth

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 in PNG where cabbages and other brassicas are grown.



Damage caused by the Diamond-back moth

CONTROL

At the present time chemical control is essential, but research is being carried out into biological methods of control which may be used in the future.

Since the Diamond-back moth has developed resistance to some chemicals in some areas, several recommendations are given below. These may not be effective in all areas. In the lowlands where the life cycle is very short, numbers increase very rapidly and the moth is often extremely difficult to control.

1. Spray weekly with a 0.5% preparation of tetrachlorvinphos (Gardona). This is prepared by mixing 10 g of Gardona 50% WP with 10 litres of water. DO NOT HARVEST WITHIN THREE DAYS OF APPLICATION.

2. Spray weekly with a 0.05% preparation of acephate (Orthene). This is prepared by mixing 6.5 g of Orthene 75% SP with 10 litres of water. DO NOT HARVEST WITHIN SEVEN DAYS OF APPLICATION.

3. Spray weekly with 0.1% preparation of pirimiphos-methyl (Actellic). This is prepared by mixing 20 ml of Actellic 50% EC with 10 litres of water. DO NOT HARVEST WITHIN SEVEN DAYS OF APPLICATION.

4. Spray weekly with 0.00125% permethrin (Ambush). This is prepared by mixing 1.25 ml of Ambush 10% EC or 0.25 ml of Ambush 50% EC with 10 litres of water. It can be applied up to harvest if necessary.

5. Spray every three weeks with 0.005% permethrin (Ambush). This is prepared by mixing 5 ml of Ambush 10% EC or 1 ml of Ambush 50% EC with 10 litres of water. It can be applied up to harvest if necessary.

It is essential to add a wetting agent at the rate recommended on the container to all of the above treatments. Where commercial wetting agents are unobtainable, ordinary washing-up liquid may be used at the rate of 2.5 ml to 10 litres insecticide mixture.

As new chemicals become available and are found to be effective, these recommendations will be updated in revised issues of this Bulletin.

Further information on pest control in brassicas can be obtained from: The Entomologist, Kuk Agricultural Research Station, P.O. Box 339, Mt. Hagen.

Copies of this Entomology Bulletin are available from: Publications Officer, Publications Section, D.P.I., P.O. Box 417, Konedobu.

FURTHER READING

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

Kranz, J., Schmutterer, H. and Koch, W. (1977). *Diseases, Pests and Weeds in Tropical Crops.* Verlag Paul Parey: Berlin and Hamburg. 666 pp.

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.