

Extension Fact Sheet 20: Diamond Back Moth



Common name: Diamond back moth

Scientific name: *Plutella xylostella*

Hosts: Cruciferous vegetables - head cabbage; Chinese cabbage; radish; cauliflower and broccoli; non-crucifer plants: *Amaranthus* and watercress.

Damage

The caterpillars do the damage. The first two stages are small and feed by mining the leaf; later, when they are too large to mine, they burrow through the leaf. The result is 1-2 cm wide cavities on the lower leaf surface leaving the waxy layer intact, which gives the appearance of windows in heavily damaged plants. Economic damage is most severe when heading begins. The caterpillars tunnel into the heads of cabbages.

Note: other pests often occur on ball cabbages along with this moth, and the combined damage is considerable. The other pests are cabbage webworm, *Hellula undalis*; cutworm, *Spodoptera litura*; and cabbage cluster caterpillar, *Crocidolomia pavonana*.

Biology and Life Cycle

The eggs are small (0.4 mm long), cylindrical or oblong, white when laid, changing to yellowish brown as they mature and ready to hatch. The eggs are mostly laid singly or in groups of two or three, on the lower leaf surface along major veins. One adult female lays 100-150 eggs in a life span of 3-7 days. The incubation period ranges from 3-8 days depending on the temperature.

There are four larval or caterpillar stages. At hatching, the caterpillars are light brown; later, when fully grown, they are dark green. When disturbed, the larvae wriggle backwards, and may drop from the leaf on a silk thread. The larval period ranges from 14-28 days, after which they make a silken cocoon and pupate.

The pupa is dark green or light brown, about 10 mm long, and usually stuck to the underside of the leaf. Pupation lasts 5-10 days.

After pupation, the adult moth emerges from the cocoon. It is about 10 mm long with a 13 mm wingspan, dark brown with three white diamond-shaped patterns on its back; these give the moth its common name (photo, left). The adult lives for up to 35 days.

The life cycle is complete in less than 1 month, depending on the temperature. The moth is most active at night.

Detection and Inspection

The onset of Diamond back moth infestation can be monitored by:

- visiting the field everyday, looking for any adults or larvae on the plants;
- putting yellow sticky traps in the field to catch flying adults;
- putting sticky traps baited with Diamond back moth sex pheromone to trap male adults.

Management

Natural enemies

There are several parasitoids of the different stages: eggs - *Trichogrammatoidea bactrae*; caterpillars - *Cotesia plutellae*, *Diadegma semiclausum*, *Microplitis plutellae*, *Oomyzus sokolowskii*; pupae - *Diadromus collars*.

Cultural control:

- Always start with healthy, insect-free seedlings;
- Hand pick larvae when numbers are low;
- Destroy crop residues after harvest, and crucifer weeds before planting and during the cropping period;
- Grow head cabbages during the cooler times of the year (June-November) to avoid infestations - done by some farmers on the Guadalcanal Plains;
- Grow collards, *Brassica oleracea acephala* cv. Vates, as a trap crop. Trap crops for the other species are: radish and green mustard (*B juncea*) for *Hellula undalis*); Chinese cabbage (*B pekinensis* cv. Tempest) or flowering green mustard for *Crocicidolomia pavonana*. (Note that the latter was also useful as a trap crop for *Halticus tibialis*);
- Where farmers have the resources, grow plants under nets or in green houses;
- For watercress, grown on rafts in the river, sinking one half for 30 min and then the other end, to drown the caterpillars is a measure worth trying.

Chemical control:

- If pesticides are used, there is need for careful choice. If one chemical is used all the time, it is likely that the Diamond back moth will develop resistance to it;
- Those products that are recommended are plant-derived products, such as chili (with additional soap), and synthetic products that contain disease-causing organisms, such as spinosad (Success) and Bt - *Bacillus thuringiensis*. Spinosad and Bt are sometimes sold in Honiara.
- Indoxacarb (Steward), a new product with a novel action is not yet available in Honiara.