
Diamond-back moth Namibian crop pests # 40

Plutella xylostella (L.)

Order: Lepidoptera

Family: Plutellidae



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Caterpillar on cabbage leaf



Imago (photo: Otto Buhl, Denmark)

Common names: **Diamond-back moth** (DBM) (English), **Liyeya limbimbidi** (Gciriku), **Ruit rug mot larwe** (Afrikaans)

Host: All species of Brassica (Cabbage, Kale, Rape, Broccoli, Turnip, Cauliflower) and a wide range of wild species, including wild mustard and wild radish. Because there are many host plants and these plants are often grown throughout the year this contributes to maintaining and often increasing both pest and natural enemy populations.

Pest status:

Diamond-back moth is a very common and widespread pest of cabbage, Chinese cabbage and other Brassicas spp.. Severe attacks sometimes occur, especially in hot dry weather. The pest thrives in tropical, subtropical as well as temperate climates. Under Namibia's hot conditions the pest is able to develop rapidly almost throughout the year; a generation being completed in two weeks in summer and 3 - 4 weeks in winter. Several generations may be completed on one crop in the field, and with this pest population numbers increase significantly. Infestations normally commence in spring and the insects become more abundant in dry summers.

Description:

The adult moth is small, about 7 - 8 mm long when at rest, grey in colour, with three pale triangular markings on the inner edge of each forewing, forming a triple diamond pattern when the wings are folded over the back.

The tiny cigar-shaped white eggs are laid, either singly or in small groups, near the midrib or a strong vein of a leaf. Incubation period is 3-8 days depending on the environment.

The caterpillars are light brown, about 2 mm long when they hatch, becoming green and growing to a length of about 12 mm. They are extremely active and, when disturbed, wriggle away rapidly and drop from the leaves on silk threads, by means of which they later climb back onto the plants. The total larval period varies from 14-28 days.

Pupation takes place inside a gauze-like silken cocoon about 9mm long, which is stuck to the underside of a leaf; the pupa is greenish at first and changes to brown colour as the moth develops. The pupal stage last from 5-10 days.

A single female moth may live for 14 days and lay more than 400 eggs. In the tropics breeding is continuous with as many as 15 generations a year.

Note: The larvae of DBM are often confused with larvae of the cabbage (head) borer, also called cabbage webworm (*Hellula undalis*). The latter is also a common pest in cabbage in Northern Namibia. Larvae are creamy white and the head is black. These larvae feed by mining and boring on plant parts, and especially cause a lot of damage to the growing points of young seedlings.

Damage:

The caterpillars of the diamond-back moth feed on the leaves, usually on the undersides, eating into the tissue, leaving only veins and the upper epidermis, giving the leaves a windowed appearance, which grow in size, eventually forming holes as the leaves grow and the dead tissue tears. On young seedlings, the growing point of the plant may be damaged, often resulting in death of the plant. In older plants new shoots are produced and the attacked plants produce several small heads of little value.

Control:

Biological control

In Namibia no work has been undertaken to collect or identify natural enemies of DBM.

Some of the species that are known to parasitise diamond-back moth larva are of the genera *Diadegma* sp. *Apanteles* sp., *Cotesia* sp. and *Tetrastichus* sp. They are mainly small wasp-like insects that lay their eggs inside the DBM larva. When the eggs hatch the small wasp larvae feed on the DBM larvae. Birds such as chicken can be used in the garden to control the caterpillars. However, if you leave chicken in the garden for too long, they will start feeding on the green leaves of the crops.

Use of botanical pesticides

Research in other countries showed that Neem (*Azadirachta indica*)-based products give good control of DBM. They are relatively harmless to natural enemies and non-toxic to warm-blooded animals. The action of neem is relatively slow, thus the larvae may survive for a few days after application, but their growth and feeding is inhibited and the larvae die. Any individuals that manage to develop to the adult stage may be deformed and/or have reduced egg-laying capacity. In Namibia neem is still a relatively unknown product, although some seed producing trees can be found at ADC's in Kavango and at Mahenene RS. The Directorate of Forestry currently promotes this multipurpose tree in community gardens in the north. At present three different botanicals (Neem-powder, chilli/garlic and tobacco) are tested at Mashare ADI. Contact the horticultural section at Mashare ADI for an update on the latest results.

Cultural practices

Field hygiene is very important. Cultural control includes keeping down weeds early in the year to reduce the egg laying sites and at the end of a growing cycle, the cabbage-remains should be uprooted and burned. This will avoid the carry-over of

the pest to the next Brassica crop.

Other methods that were reported to be effective in Kenya are intercropping with plants that have a repellent effect, such as tomato and using overhead sprinkler irrigation for 5 minutes, just before dusk. This disturbs the moth's activity and can also result in run-off of the larvae, thus increasing its mortality.

Resistant varieties are not yet available, however dark green glossy-leafed species of Brassica tend to be less susceptible.

Chemical control

In many parts of the world this insect has developed resistance to the common insecticides and control may be a serious problem. In Namibia spraying with Malathion (active ingredient mercaptothion) is still found to be an effective chemical control method. However, remember to use chemicals only as a last resort and in combination with the methods mentioned above.

References:

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