AVRDC International Cooperators'

Fact Sheet

Crucifer Pests

Diamondback Moth

Plutella xylostella

Found throughout tropics and subtropics

Damage Symptoms

Early signs are feeding damage between the leaf tissues on the undersides of the leaf. Later leaves appear with windows or holes in them. Damage is confined to areas between the veins. On young plants, the growing tips are eaten and seedlings appear stunted.

Close-up of damage

Insect Characteristics

Chewing mouthparts. Caterpillars are pale green. Their bodies are wider toward the middle and they wiggle violently when disturbed. Commonly they drop off the leaf surface and, like spiders, spin down on a silken thread. Adult moths are small and gray with a diamond shape on their backs when they are at rest.

Adult (note silvery diamond on back)

Where to Look

In young plants, carefully inspect the growing tips and determine if stunting has occurred. Look at the undersides of the leaves for chewing injury. Peel back the wrapper leaves of cabbage for signs of chewing injury and frass from caterpillars.

Pupae in cocoons on underside of leaf

Technical information

Female moths lay their eggs singly or in groups of two and three on crucifer leaves. Caterpillars mature in 10-30 days and pupate directly on the leaves in a silken cocoon. Female moths attract males with a sex pheromone. There may be several generations throughout the year. These

pests have developed resistance to practically all insecticides used in Asia.

Cotesia and *Diadegma,* parasites of DBM

Control

Conserve natural enemies. Although diamondback moth (DBM) originated in Europe, it is not a serious pest there. This is because natural enemies in that continent keep DBM populations in check. It is essential to conserve as many existing natural enemies as possible. In nearly every country in the tropics and subtropics, a high temperature-tolerant larval parasite *Cotesia plutellae* can be found in lowland and in some mid-level highland areas. In cold highlands, the larval parasite *Diadegma semiclausum* and pupal parasite *Diadromus collaris* are present or can be introduced with little effort. The highland parasites are much more effective than lowland ones. In the lowlands, an egg parasite *Trichogrammatoidea bactrae* is useful. Except for the egg parasite, these natural enemies cannot be used like pesticides whenever you need them. They are released in large numbers once or perhaps a few times and allowed to multiply on their own.

Diadegma and *Diadromus* are established in most highland areas of SE Asia, and *Cotesia* is established in the lowlands. There is no need to release these parasites in areas where they are already present. But these parasites need to be conserved.

Intensive use of broad-spectrum chemical insecticides to control DBM has killed the parasites and prevented them from controlling DBM. Since most chemical insecticides are useless in controlling DBM, the use chemicals should be minimized. If you must use insecticides to control pests on cabbage, consider using products that utilize *Bacillus thuringiensis* or neem, both of which are not harmful to DBM parasites. If DBM is your target pest and you are planting the first crucifer crop after the rainy season, postpone application of chemical insecticides as late as possible to let the natural enemies proliferate.

Pheromone traps can be used to monitor for adult DBM males. These traps are currently expensive, but will likely be more affordable in the future. Once DBM adults are found, *Trichogrammatoidea* egg parasites can be released.

Clean cultivation. The field should be cleaned of plant debris after harvest, as DBM larvae and pupae remain in plant debris. Keep the crop weed-free because DBM can feed on certain weeds, especially crucifer weeds.

Selective use of natural insecticides. Observe the plants regularly, if DBM populations are increasing, then start applying the natural insecticides Bacillus thuringiensis or neem.

Barrier nets. Cover crucifer seedlings with a fine nylon mesh net or plastic sheet to prevent DBM adults laying eggs on their leaves. This method will postpone DBM infestation, reduce the need for control measures so early in the season and help in conservation of natural enemies.

In peri-urban areas where farm size is small, barrier nets can be used effectively to partially exclude DBM and other pests. The planting of crucifers should be confined on all four sides using a 2-m high barrier net (#16 mesh). At the top of the net, an additional 30-40 cm of the netting should be stretched outwards and then down to make an angle of 80° against the net wall.

Last updated: 2001.
Information from: Field Guide: Insect Pests of Selected Vegetables in Tropical and Subtropical Asia. 1995. B.L. Parker, N.S. Talekar and M. Skinner. Publication 94-427. Pest control recommendations added.