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Popular Article

Integrated Pest Management of Diamondback moth, *Plutella xylostella* in cruciferous vegetables

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Introduction

Diamondback moth (DBM), *Plutella xylostella*, is destructive insect pest of cruciferous crops worldwide. The changing cropping pattern, monoculture, intensive cultivation of high yielding varieties, negligence of crop rotation, non-adoption of summer ploughing besides negation of other cultural practices and injudicious use of insecticides have aggravated this pest problem in cruciferous vegetables. Thus, the result is that DBM has developed resistance to most commonly used insecticides. Therefore, eco-friendly pest management (IPM) is now being considered to manage DBM in a more sustainable manner.

Host: Broccoli, brussels sprouts, cabbage, Chinese cabbage, cauliflower, collard, kale, mustard, radish, turnip etc.

Biology and Identification

Eggs are spherical and flattened minute yellow coloured and laid singly or in groups on the upper surface of leaves. Females may lay average 150 eggs. The egg hatch in 5-6 days. The diamondback moth has four instars. The larvae are pale yellowish green in colour. Pupation takes place on the foliage in a transparent cocoon and formed on the lower or outer leaves. The duration of the cocoon average about 5 to 15 days. Adults are small greyish brown moth. Adult folds the wings that appear with triangular markings, with diamond shape. Total development time from the egg to pupal stage average 25 to 30 days.



Symptoms of damage

Feeding habit of young instar larva is leaf mining, thereafter grown larvae feed on the lower surface and upper surface of the leaf. Their chewing results in irregular patches of damage, scrapping of epidermal leaf tissues which produces typical whitish patches on leaves. Full-grown larvae bite holes in the leaves and feeds on curd and head.

Management

- ✓ Crop monitoring or crop scouting is the regular systematic checking of crops for pest activity.
- ✓ Crop rotation with non-host crop such as cucurbits, beans, peas, tomato and melon.
- ✓ Growing of mustard as a trap crop at the ratio of 2:1 (cabbage: mustard) at least 10 days ahead of planting of main crop to attract female adult moth for oviposition. Thereafter, spraying of mustard crop with Lufenuron 5.4 % EC 1.2 ml/lit to avoid dispersal of the larvae.
- ✓ Installation of the pheromone traps @12/ha to monitor the population of adult moth.
- ✓ Inter cropping of cabbage or cauliflower with marigold, garlic or onion also reduces the incidence of DBM population.
- ✓ Mass releasing of larval parasitoid, *Cotesia plutellae* at 20000/ha from 20 days after planting.
- ✓ Planting of clean and healthy seedlings in the field.
- ✓ Removal of all debris and stubbles after harvest of crop which harbour the overwintering stages of the pest.
- ✓ The predator green lacewings *Chrysoperla carnea*, also feeds on eggs and young larvae.
- ✓ Spraying of the any one insecticide with different mode of action and rotation of insecticide further at 15, 30 and 45 days after sowing at the economic threshold level such as spray of (Bt) *Bacillus thuringiensis var. kurstaki* @ 2 g/lit of water or Neem seed kernel extract 5% when pest pressure is low. Cartap hydrochloride 50% SP @ 0.5%, Lufenuron 5.4 % EC 1.2 ml/lit., Spinosad 2.5 % SC, 1.2 ml/lit or chlorfenapyr @ 200 g a.i./ha when pest pressure is high.

