



**DOVE**  
**ASSOCIATES**

Horticultural Consultants

Weggs Farm

Common Road

Dickleburgh, DISS

Norfolk IP21 4PJ

Tel: 01379 741200

Fax: 01379 741800

Email: [info@dovebugs.co.uk](mailto:info@dovebugs.co.uk)

[www.dovebugs.co.uk](http://www.dovebugs.co.uk)

## Information

### Biological Control - CATERPILLARS

Caterpillars are generally less of a problem when broad-spectrum pesticides are used. In crops where biological control is practised however, they commonly cause damage that necessitates treatment.

The moth species whose caterpillars cause the most damage are:-

TOMATO MOTH	Damages tomato, peppers and chrysanthemums
SILVERY MOTH	Damages lettuce, peppers and chrysanthemums
ANGLESHADES MOTH	Damages peppers and chrysanthemums
CABBAGE MOTH	Damages peppers and chrysanthemums
GOTHIC MOTH	Damages chrysanthemums
CARNATION TORTRIX MOTH	Damages carnations, roses and chrysanthemums

#### The life cycle of moths

Moths usually lay their eggs on the underside of leaves. They hatch in a few days and the young caterpillars feed on the bottom layers of cells of these leaves. After a few days they disperse over the plant. As they grow, caterpillars start to feed more voraciously and skeletonise leaves. In the cases of the Carnation Tortrix moth, leaves are spun together and the caterpillar feeds safely within.

Sometimes caterpillars eat fruit and flowers causing economic damage, e.g. the Tomato moth commonly attacks fruit often causing large cavities.

When the caterpillar is mature it pupates. This sometimes happens on the plant, but more usually pupae are found on the greenhouse structure or on or in the soil. In greenhouses there are usually several generations a year, but pupae produced in the autumn usually over winter in the pupal state. When this happens hatching takes place in the spring and within a short time the moths fly to plants to lay eggs.

**Use plant protection products safely. Always read the label and product information before use**

Dove Associates shall in no event be liable for any loss or damage caused by the use of products mentioned in this document.

© Dove Associates 28/02/13

## **BIOLOGICAL CONTROL**

The microbial insecticide DIPEL DF, which contains spores of the bacteria *Bacillus thuringiensis* and crystals of a toxic protein, is effective against most species of moth caterpillar. However, species vary in their susceptibility and rates and timings have to be adjusted to gain satisfactory results. The insecticide works by paralysing the mouthparts and the gut muscles of the caterpillar, which starves to death.

Populations can also be monitored by using pheromone traps. These catch some of the first moths which enter the greenhouse or emerge from pupation and are thus an early warning of impending egg-laying. DIPEL DF should be applied about 10 days after the first moths are caught.

### **Dipel DF**

DIPEL DF is supplied in 500g packs. It is a wettable powder and compatible with a number of other products, which may be used in an integrated control programme. It is used at a rate of 0.75kg/ha for ornamentals.

### **Pheromone lures in Delta traps**

Delta traps should be hung up early in the New Year. Use one lure per trap and five traps per hectare (2 acres). Lures are available for a wide range of moth species including light brown apple moth, carnation tortrix moth, summer fruit tortrix moth and cyclamen moth. Install the full range of traps and lures for initial identification of the moth species attacking the crop. Once the species has been identified the lure needs to be re-ordered for that species and then changed every 4-6 weeks.

### ***Steinernema carpocapsae***

These parasitic nematodes attack the larvae of soil and leaf-dwelling pests including crane flies and various caterpillars. These particular nematodes require a fairly high humidity within the compost to work effectively. The compost/soil temperature needs to be between 12-32°C. They are very susceptible to ultraviolet light (UV) and the best time for leaf applications is in the evening for minimum exposure to UV and maximum moisture availability.

After application the nematodes search their surrounding area for passing insect larvae. The nematode enters the larval stage of the pest through a natural body opening. Once inside the larva the nematode excretes specific bacteria from its digestive tract before it starts to feed. The bacteria multiply very rapidly and convert the host tissue into products that the nematodes take up and use for food. The larva dies within a few days. The nematodes multiply and develop within the dead insect. As soon as the nematodes are in the infectious third stage, they leave the old host and start searching for new larvae. When there are no new hosts present, the nematode population will slowly decrease. The main visual effect is that the caterpillars change colour and sometimes become slimy.

### ***Trichogramma spp.***

This is a parasitic wasp which lays its eggs inside the eggs of the carnation tortrix moth. It is most efficient when there are groups of moth eggs together. The recommended rate is 10 wasps per m<sup>2</sup> per week from May to September.

**Use plant protection products safely. Always read the label and product information before use**

Dove Associates shall in no event be liable for any loss or damage caused by the use of products mentioned in this document.

© Dove Associates 28/02/13