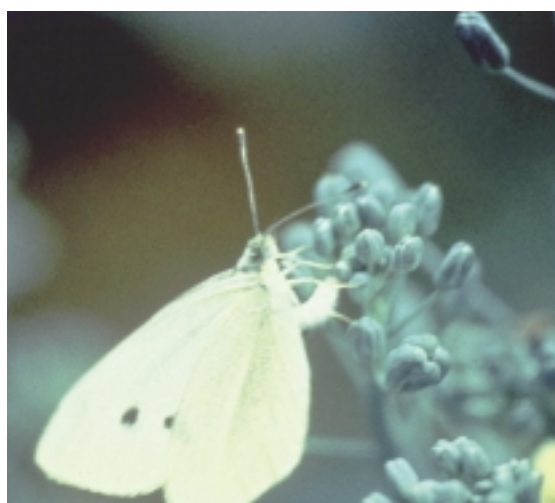


# Caterpillar Pests

While commonly thought of as threats to vegetable crops, caterpillars can also ravage annuals and perennials. Learn how to identify, prevent and control an infestation before they chew away your crops and profits.



Above left: Beet Armyworm on coleus. (Photo courtesy of Raymond Cloyd) Right: Imported Cabbageworm adult feeding on pollen/nectar. Female moths have two black spots on their wings, whereas males have only one spot. (Photo courtesy of Rick Foster)

Caterpillars, the larval/immature stage of moths and butterflies, are generally not considered a major pest of greenhouse-grown crops. However, during summer through fall, moths can enter greenhouses through doors, vents and side-walls (which are usually open) and lay eggs that hatch into caterpillars. These caterpillars have chewing mouthparts and will feed on a variety of plants. If left unchecked, caterpillars can severely damage a crop; herbaceous plants, such as annuals and perennials located outdoors, are especially susceptible to attack.

Caterpillars that are most commonly encountered and most problematic on plants grown both indoors and outdoors include beet armyworm (*Spodoptera exigua*), cabbage looper (*Trichoplusia ni*), imported cabbageworm (*Artogeia rapae*), diamondback moth (*Plutella xylostella*), European corn borer (*Ostrinia nubilalis*), cutworms and leafrollers. Some caterpillars feed on particular plant types or feed on crops in a certain plant family. For example, imported cabbageworm, diamondback moth and cabbage looper primarily feed on plants in the cole

crop family (Cruciferae), which includes ornamental cabbage and kale.

## IDENTIFYING THE CULPRIT

Imported cabbageworm is a velvety green caterpillar approximately 1 1/4 inches long with a yellow stripe down the back and a broken line of yellow spots along each side. Diamondback moth caterpillars are small, approximately 1/8-inch long, light green and mine leaves. Cabbage looper caterpillars are also light green, approximately 1 1/2 inches long, with white stripes down the back and along the side. In contrast, the imported cabbageworm caterpillar is a deeper green with yellow stripes. In addition, it has three pairs of legs near the head and three additional pairs, referred to as prolegs, near the rear.

The lifecycle consists of an egg, caterpillar or larva, pupa and adult. Adult female moths, which are generally most active at night but can be seen during the daytime, lay eggs on leaf undersides. The number of eggs laid depends on the species, with females laying anywhere between 20-100 eggs during their lifetime. Eggs hatch into caterpillars that consume plant foliage.

Caterpillars go through several stages, from one instar to the next, where from one species. Caterpillars then less as they grow.

The caterpillars spend several days. Eventually, they transition to spinning cocoons on plants, in stems or on the ground. After a few days, they emerge from the cocoons to adult taking flight, depending on the species.

## CONTROL

The major control is to remove the eating plant parts. They may eat through the mid-vein (frass) on plants. Caterpillar activity with silken threads actually tunnels through plant populations and



Top: Cabbage looper larvae. Bottom: Cabbage looper adult. Adults have dagger-shaped markings on the forewings. (Photos courtesy of Rick Foster.)

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lay eggs. Managing weeds inside and outside the field can help reduce problems with caterpillars, because weeds are often the first place for them to lay eggs. In addition, cleaning up plant debris can help reduce the number of overwintering pupae. Pheromone traps can be used indoors and outdoors and are helpful in detecting pest activity. Traps on a regular basis when adult moths are present can help monitor the crop. Placing sticky cards near plant debris can help. A house will capture adults; this can serve as a trap. Traps and applications of pest control materials. When scouting for openings (e.g., vents, doors and sidewalls) and sealing them, adult moths will enter, especially locations that are in decline or have been harvested.

Pest control materials are directed primarily at the caterpillar stage. Most of these materials have contact activity only, so thorough coverage of all plant parts is essential. Systemic insecticides are generally not effective in controlling caterpillars. The microbial insecticide Dipel (*Bacillus thuringiensis* var. *kurstaki*) is the most commonly used pest control material for caterpillars. While very effective, it must be applied when caterpillars are young. The active ingredient has to be consumed to be effective and young caterpillars don't have to consume as much material before they die; however, larger caterpillars must eat more before the active

Top: Diamondback moth adults. The wings are held in a diamond shape.



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Above: Imported Cabbageworm caterpillar with a yellow stripe running along its side. Below: A yellow sticky card with a caterpillar caught on it. Imported Cabbageworms outdoors can be caught on sticky cards. A yellow stripe on the card is an indication to be on the lookout for caterpillars. (Photos courtesy of Raymond A. Cloyd)

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ingredient inhibits feeding. In the meantime, it may cause plant damage. Dipel may need to be reapplied when used outdoors, as environmental conditions such as light and rainfall, may shorten residual activity. Dipel, which is widely used for thrips control, is also effective on caterpillar pests. A recently registered biocontrol, Confirm (tebufenozide) is an insect growth regulator (hormone mimic) that also has activity against caterpillars. Additional pest control materials, including natural chemical class, such as Talstar, Decathlon, and Fenpropathrin, are labeled for caterpillars. However, when using biocontrols; be sure to consult the label for instructions. Using biocontrols or if your crop is not labeled for controlling caterpillars are

Table 1. Pest control materials for caterpillars.

Common Name (Trade Name)	Restricted Entry Interval
Azadirachtin (Azatin)	1.0
Azadirachtin (Ornazin)	0.25
<i>Bacillus thuringiensis kurstaki</i> (Dipel)	0.25
<i>Beauveria bassiana</i> (Naturalis)	3.0
Bifenthrin (Talstar)	0.8
Cyfluthrin (Decathlon)	0.13
Fluvalinate (Mavrik)	0.4
Fenpropathrin (Tame)	1.0
Permethrin (Astro)	0.4
Spinosad (Conserve)	0.25
Tebufenozide (Confirm)	2.5

\* Restricted Entry Interval

An alternative management strategy for caterpillar problems with caterpillars on a regular basis is to use parasitoids for release into the greenhouse. Parasitoids are insects that attack the egg stage of various caterpillar pests, including the cabbage moth, cabbage looper and imported cabbageworm. The life cycle of parasitoids is approximately seven days as it develops up to 10 days as adults. Several species of parasitoids, including *T. minutum* and *T. pretiosum*, are available for release. For more information, consult a biological control specialist.

**Raymond A. Cloyd is assistant professor and director of the entomology/integrated pest management program at the University of Arkansas. He may be reached by phone at (217) 244-7200.**

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