



Yard & Garden **BRIEFs**

CATERPILLAR PESTS OF COLE CROPS IN HOME GARDENS

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Imported cabbageworms (*Artogeia rapae*), cabbage loopers (*Trichoplusia ni*), and diamondback moths (*Plutella xylostella*) are the most common caterpillar pests in cole crops. Of the three, imported cabbageworms are encountered most frequently and usually cause the most damage in home gardens. Cole crops include cabbage, cauliflower, broccoli, kale, rutabaga, radishes, turnips, collards, horseradish, and other crucifers. All three caterpillar species cause similar damage to cabbage and related plants.

IDENTIFICATION

Imported Cabbageworm The adults are white butterflies with black spots on the forewings that are commonly seen flying around plants during the day. The caterpillars are velvety green with faint yellow stripes running lengthwise down the back and sides. Full grown caterpillars are about 1 inch in length. They move sluggishly when prodded.



Imported cabbage worm adult (cabbage butterfly).

Cabbage Looper Unlike imported cabbageworm adults, cabbage looper adults are nocturnal moths, but they can be seen resting on the underside of host plants during the day. The moths are dark brown with small, white squiggles in the middle of their wings. The caterpillars are pale green with narrow white lines down each side. Since looper caterpillars have no legs in their middle sections, they have a characteristic looping motion as they move across vegetation. Full grown caterpillars are about 1½ inches in length.



Diamondback Moth Diamondback moths are also nocturnal flyers. The moths are light brown and slender. When the moths are at rest, their folded wings show a pattern of three diamonds. Diamondback caterpillars are much smaller than either imported cabbageworms or cabbage loopers. Mature caterpillars are about 1/3 of an inch long, light green, tapered at both ends, and wiggle vigorously when touched.

Imported cabbage worm pupa (above) and larva.



LIFE CYCLE

All three species have similar life cycles. The eggs hatch into caterpillars, the stage that damages vegetables. After feeding for a period of weeks on the host plant, the larvae pupate in protected areas, and then emerge as adults.

Cabbage looper

Imported Cabbageworm Imported cabbageworms overwinter in the upper Midwest in green pupal cases. Adults start appearing in gardens in May and are a problem through the remainder of the growing season. There are 3 to 5 overlapping generations a year.



Diamondback moth

Cabbage Looper In contrast to imported cabbageworms, cabbage loopers do not overwinter in the upper Midwest. Although the time they arrive from the south varies from year to year, cabbage loopers generally migrate into Minnesota from early July to late August. In the upper Midwest, there are 1 to 3 generations a year during the growing season depending on their arrival time and late summer temperatures.

Diamondback Moth Diamondback moths may survive northern winters in protected locations as adults. They may also be transported into the upper Midwest on cole transplants shipped from the South. Diamondback moths start appearing in northern gardens in mid May. Although they can be pests through the remainder of the growing season, they are usually less severe after spring. There are generally 3 to 5 generations a year.

DAMAGE

The caterpillars of all three species feed between the large veins and midribs of cole crops. The young imported cabbageworm and the cabbage looper produce small holes in the leaves that generally do not break through to the upper leaf surface. The larger caterpillars, however, chew large, ragged holes in the leaves leaving the large veins intact. When feeding on cabbage, broccoli, or cauliflower, they often crawl toward the center to feed as they mature. They leave large amounts of frass (fecal matter) where they have been feeding. Initially, diamondback caterpillars feed inside the leaves but after a few days move to the outside of the leaves to feed. They often eat all the leaf tissue except the upper layer, resulting in a characteristic windowpane look.



Cabbage looper damage

Cole crops, like many vegetables in the home garden, can tolerate some feeding damage. Young seedlings and transplants are the most susceptible to feeding damage. Extensive defoliation of young plants can cause distorted growth or even death. Extensive feeding can also prevent the head formation of cabbage, cauliflower, and broccoli. Older plants, however, can tolerate considerable defoliation with little or no effect on yield. Generally, do not allow defoliation to exceed 50%. However, it may be desirable to limit feeding damage for aesthetic reasons, especially if the caterpillars start to damage the heads of cabbage, cauliflower, or broccoli or the leaves of kale or collards.

MANAGEMENT OPTIONS

Start checking for caterpillars on cole crops in May or after seeing adult cabbageworm butterflies flying around the garden. Inspect your vegetables at least once a week. Check both sides of leaves for caterpillars and their feeding damage. Focus on eliminating the smaller caterpillars. The older, larger caterpillars of all three species cause the most feeding damage.

PHYSICAL

Handpicking the caterpillars, especially in smaller gardens, can be effective. Drop the caterpillars into a pail of soapy water to kill them.

Install floating row covers over crops to prevent adult moths from laying eggs on plants. Install the row covers over the cole crops at seeding or transplanting. The row covers may be removed upon harvesting the cole crop.

CULTURAL

Destroy crop residue immediately after harvest to eliminate potential overwintering sites for imported cabbageworms. Eliminate weeds from the Brassicaceae family such as wild mustard, peppergrass, and shepherd's purse, as they are a potential food source for the caterpillars.

BIOLOGICAL CONTROL

At least 14 parasitic wasp and fly species attack these caterpillars in the upper Midwest. Some wasps and flies insert their eggs into the caterpillars while others attack the pupae. As the wasps or flies develop within the caterpillar or pupae, they eventually kill their hosts. Some wasps also parasitize the eggs of these caterpillar pests. The wasp and fly parasites are small and do not sting or bite people.

INSECTICIDES

The best time to treat caterpillars is while they are still small. Insecticides are not as effective in killing older

caterpillars. *Bacillus thuringiensis* (Bt) is a less toxic, biological insecticide that is specifically targeted towards caterpillars. Using Bt will not harm the caterpillars' parasites or predators. The home gardener may also use broad spectrum pesticides such as permethrin (e.g., Eight) or carbaryl (e.g., Sevin). However, broad spectrum insecticides will also kill natural enemies that are present in the garden.

CAUTION: Read all label directions very carefully before purchasing and again before using an insecticide. Information on the label should be used as the final authority. Treat only plants listed on the label of the insecticide.

This publication was modified from Department of Entomology University Minnesota publications entitled *Imported Cabbageworm* by W.D. Hutchison, P.C. Bolin, and R.L. Hines; *Cabbage Looper* by W.D. Hutchison, H. Hoch, P.C. Bolin, and R.L. Hines; and *Diamondback Moth* by W.D. Hutchison, P.C. Bolin, and R.L. Hines.

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