



Caterpillar Pests of Cole Crops

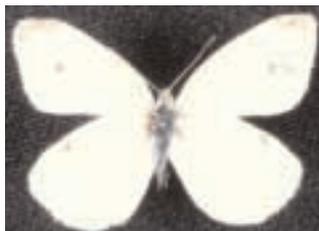
K.A. Delahaut

Imported cabbageworms (*Pieris rapae*), **cabbage loopers** (*Trichoplusia ni*) and **diamondback moths** (*Plutella xylostella*) are three key pests of Wisconsin cole crops, with the imported cabbageworm being the most significant. Diamondback moths are troublesome because of their tolerance to many chemical insecticides. The cabbage looper attacks beets, celery, lettuce, peas, potatoes, spinach and tomatoes, in addition to cole crops.

Damage caused by these pests is generally of little economic importance.

Appearance

Imported **cabbageworm** adults are the white butterflies seen in great numbers on warm summer days. Female butterflies have 2 black dots on each fore wing; males, which are smaller, have 1 dot per wing. Larvae appear as velvety



Adult cabbageworm



Imported cabbageworm

loopers gets its name from the way it arches its body as it moves. When fully grown, its greenish body is 1½ inches long and tapers near the head. A thin white line runs along each side and two white lines run along the back. The adult cabbage looper is a greyish-brown, night-flying moth with a wingspan of 1½ inches. The mottled brown fore wings are marked near the middle with a characteristic small, silver-white figure 8 or letter Y.



Cabbage looper

green worms up to 1 inch long with a faint yellow stripe running down the back.

The **cabbage**



Diamondback moth adult and larva

The **diamondback moth** is a small, greyish-brown, night-flying moth with a 1-inch wingspan. It holds its wings together in the form of a small roof over its back when at rest. In this position, a pattern of three diamond-shaped spots can be seen along the top of its body. The small caterpillars (up to ¾-inch long at maturity) are pointed at both ends and range in color from cabbage green to yellow. You may see the larva when it is disturbed since it wiggles its body back and forth, often causing it to fall from the plant.

Symptoms and effects

Larvae of all three insects feed between the large veins and midribs on cole crop leaves. In the case of the imported cabbageworm and cabbage looper, feeding occurs primarily on the upper leaf surface near the midrib producing large, irregular holes. Diamondback moth larvae,

Scouting suggestions

Scout fields weekly throughout the season for damage. Check plants carefully—even if no feeding damage is apparent—to look for eggs that will hatch into small caterpillars several days to a week later. Examine the lower leaves of the plant for the larvae of each pest. Although feeding damage and fecal material are signs of activity, it's better to rely on larvae counts to determine the level of infestation. Caterpillars cause varying amounts of damage depending on the plant's maturity, so the need for treatment changes as the crop grows. Keep a record of which insect is present, its life stage and the percentage of plants infested. This information will be useful for monitoring whether the population is increasing or decreasing.

Treatment thresholds are well established and based on the percent of infestation by any lepidopteran species. Established thresholds (ETs) vary based on the stage of crop development. Cabbage, broccoli and cauliflower in the seed bed are particularly susceptible to damage. Therefore, control measures are warranted when 10% of the plants are affected. Between transplant and cupping, the ET is raised to 30%. From the time the

plants begin to cup until early heading, if more than 20% of plants are infested, you should treat them. From early heading until harvest, the threshold drops back to 10% to protect the market quality of the produce.

When you transplant broccoli or cauliflower and it produces flowers or curds, increase this threshold to 50%. When flowers or curds begin to develop, the economic threshold drops back to 10% to maintain a high level of quality.

Control

Cultural: Effective integrated pest management (IPM) programs for caterpillars should be designed to prevent damage, encourage natural control and avoid resistance. The use of transplants that are free of larval contamination is a key step in avoiding damage. Spring plowing of debris and clean culture are good insurance against potentially overwintering imported cabbageworm pupae, as well as cabbage disease problems. Floating row covers can provide a physical barrier to imported cabbageworms in small cole crop plantings. Natural controls are frequently quite effective in holding down cabbageworm populations.

Chemical: *Bacillus thuringiensis* var *Kurstaki* or *Aisawai* applied to early instar larvae can be very effective in controlling imported cabbageworms. Many chemical insecticides are also effective in controlling caterpillar pests of cole crops. Refer to the UW-Extension publication *Commercial Vegetable Production in Wisconsin* (A3422) for specific insecticide recommendations. Target early instar larvae and ensure good plant coverage to improve the effectiveness of insecticides. Use pest-specific insecticides in early to mid-season when diamondback moths and imported cabbageworms are prevalent so as not to destroy other beneficial insects.

Resistance is a key concern with all lepidopteran pests on cole crops. Extensive resistance to organophosphate, pyrethroid and carbamate insecticides has been documented in the diamondback moth. Resistant larvae are easily transported into Wisconsin on transplants. Diamondback moth resistance to Bt has also been documented in parts of the United States but has not been reported in Wisconsin.

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Thanks to Jeff Wyman and Phil Pellitteri for reviewing this information.

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