

Imported Cabbageworm

Insect Pest of Vegetable Crops

Imported cabbageworm, *Pieris rapae*, is an insect pest of vegetable crops, including broccoli, Brussels sprouts, cabbage, cauliflower, collards, horseradish, kale, kohlrabi, mustard, radish, turnip, and watercress. This publication describes the biology, damage, and management of the imported cabbageworm.

Biology

The imported cabbageworm life cycle includes an egg, larva (caterpillar), pupa, and adult. The life cycle can be completed in three to six weeks, depending on the temperature. Adults are white with black spots on the front wings (Figure 1). Females have two black spots on the front wings, whereas males have one spot on the front wings. Adults fly during the day, feeding on the nectar of flowering plants and certain weeds. Mated females live about three weeks and can lay up to 400 eggs on the underside of leaves.



Figure 1. Adult imported cabbageworm.



Figures 2a and 2b. Imported cabbageworm caterpillar (top) and pupa on leaf underside (bottom) (Photos: Raymond Cloyd).



Figures 3a and 3b. Cabbage leaf damage (left) and plant completely defoliated (right) by imported cabbageworm caterpillar (Photos: Raymond Cloyd).

Caterpillars emerge (eclose) from eggs and feed on plant leaves. There are five caterpillar instars (stages between each molt). Late instar caterpillars are about 1.0 inch (25.0 millimeters) in length, green, with dense hairs on the body. All caterpillar instars, except the first instar, have a yellow stripe on the back that extends the length of the body (Figure 2a). Imported cabbageworm pupates on plants in a cocoon typically located on the underside of leaves or in debris near host plants. The pupa (chrysalis) is approximately $\frac{3}{4}$ of an inch (19 millimeters) long, green to brown, with projections protruding from the center and end of the pupa (Figure 2b). Imported cabbageworm overwinters as a pupa. There are three generations per year in Kansas.

Damage

Imported cabbageworm caterpillars feed on the underside of leaves, in between the veins, creating irregularly shaped holes in plant leaves and jagged leaf edges (Figure 3a). Caterpillar feeding can completely defoliate plants (Figure 3b). Older caterpillars may tunnel into the heads of broccoli and cabbage. Caterpillars produce frass or fecal deposits (Figure 4) during feeding, which can stain and contaminate vegetable produce. Vegetable crops vary in their susceptibility to imported cabbageworm caterpillars. For example, Chinese cabbage, kale, mustard, rutabaga, and turnip are less susceptible to feeding by imported cabbageworm caterpillars than broccoli, Brussels sprouts, cabbage, cauliflower, and collards. In addition, varieties of vegetable crops can influence susceptibility to imported cabbageworm. For instance, females lay fewer eggs on red varieties of cabbage than on green varieties.



Figure 4. Frass or fecal deposits produced by imported cabbageworm caterpillar (Photo: Raymond Cloyd).

Management

Managing imported cabbageworm caterpillars below plant-damaging levels involves regularly scouting vegetable crops, removing plant debris and weeds, physically removing imported cabbageworm caterpillars from plants, applying insecticides during the growing season, and conserving beneficial insects.

Scouting

Carefully check the underside of leaves once per week for the presence of imported cabbageworm caterpillars. Imported cabbageworm caterpillars are difficult to find when scouting because they reside along the leaf veins, blending in with the green leaves of vegetable plants.

Sanitation

Remove and dispose of plant debris after harvest to discard any imported cabbageworm caterpillars and/or pupae remaining on plants. Eliminate weeds from the area because certain weeds, such as field pennycress, pepperweed, shepherd's purse, wild mustard, wild radish, and yellow rocket, can harbor imported cabbageworm eggs and caterpillars.

Physical Removal

Remove imported cabbageworm caterpillars by hand and kill them by placing into a container of soapy water. Place

floating row covers over vegetable plants (Figure 5) to impede imported cabbageworm females from laying eggs on plant leaves.

Insecticides

Insecticides with contact or stomach poison activity can be applied during the growing season. However, thorough coverage of leaf undersides and repeat applications are important in maintaining imported cabbageworm caterpillars below plant-damaging levels.

Beneficial Insects

Beneficial insects, such as ladybird beetles, green lacewings, assassin bugs, and minute pirate bugs, feed on imported cabbageworm caterpillars. In addition, females of the parasitoid, *Cotesia (Apanteles) glomerata* (Figure 6a) lay eggs into first instar caterpillars. Parasitoid larvae emerge (eclose) from dead caterpillars and build cocoons. Dead or parasitized caterpillars on leaf undersides have clusters of 20 to 30 yellow cocoons attached to their body (Figure 6b). Adult parasitoids emerge from the cocoons, and females search for and lay eggs into imported cabbageworm caterpillars. Avoid applying insecticides that are harmful to beneficial insects to conserve them so they can naturally maintain imported cabbageworm caterpillar populations below plant-damaging levels.



Figure 5. Floating row cover placed over plants to prevent imported cabbageworm females from laying eggs (Photo: Raymond Cloyd).



Figures 6a and 6b. Close up of *Cotesia (Apanteles) glomerata* adult (left) and cocoons of *Cotesia (Apanteles) glomerata* (right) attached to dead imported cabbageworm caterpillar (Photos: Raymond Cloyd).

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