

*Providing Leadership in Environmental Entomology*

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## INSECT PESTS OF COLE CROPS

### APHIDS

Two primary species of aphids attack cole crops; the cabbage aphid and the turnip aphids. Because they are similar in life habits and response to treatments, they will be considered together. Plants in seed beds and at all subsequent stages of their growth are frequently covered with dense clusters of whitish-green plant lice about the size of a pinhead, which suck the sap from the leaf. The affected leaves curl and crinkle or form cups, completely lined with the aphids, and in severe infestations, wilt and die. The plants, if not killed, are dwarfed, grow slowly and form small light heads that are not marketable. Badly infested plants become covered with a mass of the small soggy aphids, and the dying leaves and plants rapidly decay.

Aphids are more troublesome during cool, dry weather. Because these pests are difficult to control, treatments should be applied early. Two or three treatments at five-day intervals may be needed to clean up plants. When two percent of the plants are infested with aphids, an insecticide application should be made with high spray volume and adequate pressure to thoroughly wet foliage. Because of the waxy powder that covers the bodies of the aphids and the tendency of leaves to form pockets or cups which protect aphids, it is essential to add spreader-stickers to the spray mix. Destroy old stalks of cabbage as soon as the crop is harvested to help prevent destructive outbreaks of these aphids.

### CABBAGE LOOPER

The cabbage looper is a very destructive and difficult to control pest of cabbage and other cole crops. It is the larva of a medium-sized grayish brown moth. The moths have a figure-eight shaped silver spot near the middle of each of the front wings. They have a



Cabbage Looper

wingspread of 1¼ to 1½ inches. The moths are most active at night and fly about at plant height while they are laying eggs.

The moths lay their greenish-white eggs singly and mainly on the lower surfaces of the outer leaves of the plants. The eggs are smaller than a pinhead, ridged and almost round. Newly hatched larvae have dark heads and almost clear bodies. They later become pale green and have several white lengthwise stripes. Mature larvae are about 1½ inches long. Larvae have only two pair of abdominal prolegs and move with a looping motion.

Newly hatched larvae usually eat out small areas on the undersides of leaves. As they grow, they move to the center of the plant, eating through the leaves between the veins. Large larvae are heavy feeders and may cause serious damage to marketable heads especially when numerous. Damage however, may at times be restricted to wrapper leaves.

The pupae are at first pale green, then become copper to pale brown in color as they mature. They are encased in loosely woven cocoons that are attached to a leaf or debris near the base of the plant.

After cupping (early head formation), insecticide treatments should be made when there is an average of one larva or one new hole per 10 plants.

### CABBAGE WEBWORM

The cabbage webworm is the larva of a moth that has brownish yellow front wings mottled with darker brown, and pale gray rear wings. The moths have a wingspread of a little more than one-half inch. When disturbed in the field, moths make short, erratic flights, and come to rest quickly among the leaves of a plant or on the ground, where their color blends with that of the soil.

Moths lay grayish-white eggs near the buds of young host plants. As the plants mature, moths begin to lay their eggs on the underside of leaves in the angle along the leaf stems.

Larval webworms are about one-half inch long when mature. They are dull grayish yellow, and marked with five conspicuous brownish-purple lengthwise stripes. Their heads are black and bear a V-shaped mark.

When they first hatch, larvae feed on either side of the partly-folded leaves of the plant buds. After a few days, they begin to feed beneath a protective web made from silk-like threads that they secrete. Sometimes the larvae are found on the outer leaves or along the main plant stalk in a leaf axil. They can be detected by debris and webs at the point of feeding.

Cabbage webworms tunnel into and kill the buds of young plants. Destruction of the original bud causes the production of secondary buds that cannot mature by harvest time. Less severe injury may disfigure the head produced from the original bud. Feeding on the outer leaves of older plants usually does little harm.

The shiny, light brown pupae are about one-fourth inch long. They form in a web that is attached to fallen leaves and other debris on the soil surface.

Treatments applied for other pests usually keep the webworm under control.

### CROSS-STRIPED CABBAGEWORM

The moth of the cross-striped cabbageworm has a wingspread of about one inch. The front wings are mottled yellowish brown to brown, and are marked with zigzag lines of dark brown. The rear wings are lighter, being almost transparent at the base, darker at the front, and marked across the free end with a row of five or six small, indistinct dusky spots.

The eggs are laid in masses of 20 to 30 on the undersides of leaves of cole crops. They are light yellow and semitransparent and overlap one another as shingles on a roof.

When first hatched, the larvae are gray. When full grown, they are about three-fifths of an inch long and have numerous horizontal black stripes across bluish-gray backs. Along each side of the back is a longitudinal black stripe and below that, a bright yellow stripe. The underside of the body is light green, mottled with yellow.



Cross-Striped Cabbageworm

Cross-striped cabbageworms prefer the tender terminal buds and the heads of cole crop plants and riddle them with holes. Eggs are laid in clusters, and large numbers of the larvae hatch on individual plants scattered over a field.

The larvae enter the soil and pupate just below the soil surface in a tight cocoon. The pupae are about one-half inch long and light yellowish brown to dark brown.

Treatments made for other caterpillars generally keep these pests in check.

### DIAMONDBACK MOTH CATERPILLARS

Diamondback moths are gray about one-third inch long, and have a wingspread of less than one inch. The males have three light yellow diamond-shaped markings on their wings. The moths move rapidly when disturbed. They fly short distances from plant to plant during the daytime.



Diamondback Moth Larva

The moths lay eggs singly or in groups of two or three on the leaves. Eggs are small, nearly round and yellowish white.

The larvae are light green and pointed at each end. Their bodies are covered by tiny, erect black hairs. When mature they are about one-third inch long. They wiggle rapidly when disturbed, often dropping from the plant and hanging by silk-like threads. The larvae feed on all parts of the plant but prefer places around the bud of a young plant, crevices between loose leaves of a firm head, and the undersides of wrapper leaves. Larvae will often not eat completely through the leaf, leaving tiny "windows" of thin foliage. Their feeding may disfigure the bud of a young plant so that the marketable portion will not develop properly.

The light tan one-fourth inch long pupae are encased in loosely woven gauze-like cocoons and are fastened to the leaves of the host plant or in crevices near the bud.

After cupping (early head formation), apply insecticides when there is an average of one larva or one new hole per 10 plants.

### IMPORTED CABBAGEWORM

The imported cabbageworm is the larva of a yellowish-white butterfly. The butterflies have several black spots on their wings and a wingspread of about one inch. They fly around cabbage plants during the day.

The butterflies lay eggs singly on either side of the leaves. Eggs are yellow, oblong, bluntly pointed at the ends, deeply ridged lengthwise and attached to the leaf by one end.

The larvae are velvety green. They have a narrow orange stripe down the middle of the back and a yellowish stripe along each side of the body. When mature, larvae are about 1¼ inches long. Larvae are sluggish when disturbed.



**Imported Cabbageworm**

The pupae may be green, gray green or tan. They have sharp angular projections in front and along the back and a tough covering. They are attached by a thread resembling silk to a host plant leaf or to some other object in the field.

Imported cabbageworm damage is similar to cabbage looper injury. Imported cabbageworms feed near the center of plants and do more damage to the marketable portions. They do not restrict themselves to interveinal areas, but chew through leaves indiscriminately.

After cupping (early head formation), apply insecticides when there is an average of one larva or one new hole per 10 plants.

### **CABBAGE MAGGOT**

Plants attacked by the cabbage maggot appear sickly, off color, and stunted. If the attack is severe, they wilt suddenly during the heat of the day and die. Cabbage roots show brownish grooves over their surface and slimy winding channels running through the flesh.

Many of the small fibrous roots are eaten off. Larvae are legless white maggots, from one-fourth to one-third inch long, blunt at the rear end and pointed in front, and are often found in these borrows. Early cabbage after transplanting and late cabbage while still in the seedbed are most severely injured.



**Cabbage Maggot**

This insect goes through the winter chiefly as a pupa in a hard brown egg-shaped puparium, about one-fourth inch long, buried from one to five inches in the

soil. The adult is a fly similar in general appearance to the common house fly but only about half as long (one-fourth inch long). They are dark ashy gray with black stripes on the thorax and many black bristles over the body. The cells of the wing that open nearest to its tip are both wide open at the margin.

Flies are attracted to fields which are high in decomposing organic matter, i.e., fields recently turned, new ground, weedy areas or fields recently treated with postemergence herbicides. Any rotting vegetation is likely to attract flies. As flies enter a field, they fly about close to the ground and deposit their small white, finely ridged eggs on the plants near where the stem meets the ground or in cracks and crevices in the soil.

The eggs hatch in three to seven days and the very small maggots promptly seek the roots and eat into them. Each larva feeds for three to four weeks, and the roots often become riddled with their tunnels. The larva has at the blunt rear end 12 short, pointed, fleshy processes arranged in a circle around the two button-like spiracles. The two processes nearest the middle line below are double-pointed.

When the maggots are abundant, underground parts of the plants soon become honeycombed and rot. Over 125 maggots have been taken from the roots of a single plant. When mature, larva may pupate in its burrow, but more generally crawl away from the root into the soil a short distance and there forms its puparium. Two or three weeks later, on the average, adults break out of the puparium and may push up through the soil from a depth of six inches or more. Some of these puparia of the first generation remain until the following spring, but most of them transform into adults in late June and July. They lay eggs upon late cabbage and other plants. The injury from this second generation during dry midsummer weather is not severe, because the insect requires cool, moist weather and succulent plants in which to thrive. Enough transform, however, to produce a partial third generation in autumn when they are sometimes very destructive to fall plantings.

The cabbage maggot can be controlled by both cultural and chemical means. Any cultural practice which will reduce the decaying organic matter content of soil will reduce the chances of an infestation becoming established. Any crop residue (small grains in spring or field corn stubble, peanuts, etc. in the fall) can attract flies. If possible, turn small grain fields or other fields with a significant amount of crop residue four to six weeks before planting. This allows sufficient time for rotting of vegetation and may reduce the need for an insecticide treatment.

Postemergence herbicides also contribute to cabbage maggot problems. Weedy fields where postemergence herbicide treatments are used often become infested with maggots as dead weeds decompose. Inspect these fields daily for flies and maggots a couple of weeks after herbicide use.

### HARLEQUIN BUG

The harlequin bug is a flat, shield-shaped stink bug (3/8 inch long) with red-and-black spotted markings, on its back. The nymphs have the same markings, but are smaller and more round. The eggs stand on end in double rows and appear as tiny white kegs with black hoops.



**Harlequin Bug**  
Photo Source: Entomology Dept.,  
University of Nebraska-Lincoln

The harlequin bug can cause serious damage to crucifers and other vegetable crops.

Both the adult and nymph suck sap from the collard/cabbage plant causing it to wilt, turn brown and die. Younger plants are more susceptible to the feeding. Larger plants can withstand higher populations but show reduced growth and yellowing.

### CONTROL OF COLE CROP INSECTS

All of the caterpillars infesting cole crops can be effectively controlled using one of the *Bacillus thuringiensis* products such as Dipel®, or several other trade names. Aphids may be controlled using a systemic insecticide, or a commercially prepared insecticidal soap product. Read and follow all label directions on recommended pesticides.

Check with your local County Extension Agent for specific insecticide recommendations.

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EIS/FV-5 (New 11/1997) (revised-paz-05/011).