

## AG FACTS

## Cole Crop Pests

FILE COPY  
DO NOT REMOVE

Ed Grafius, Department of Entomology

**Cabbage maggots** can cause severe injury to roots of cole crops. Weeds such as yellow rocket and mustard are also hosts. The cabbage maggots overwinter as pupae in the soil. Adult flies (similar in size and general appearance to house flies) emerge in late April to May. Eggs are laid on or beneath the soil surface next to the host plant. The maggots (fig. 1) tunnel through the soil and attack plant roots. The maggots may kill or stunt plants (fig. 2) and cause cosmetic injury to root crops such as radishes, turnips and rutabagas. New transplants of cabbage, broccoli, and cauliflower and other cole crops are highly susceptible to injury. There are 3 generations per year. Cabbage maggot problems are most serious in cool, wet weather. It is difficult to scout for cabbage maggot adults or eggs, and preventive treatment at planting or transplanting is recommended.

**Imported cabbageworms** are the most common foliage pest of cole crops in Michigan. They overwinter as pupae, and the adult butterflies (fig. 3) emerge in late April to May. They lay single oval, yellow eggs on leaves of cole crops and wild crucifers. Cabbageworm larvae (fig. 4) are green, up to 1 1/4 inches long and feed on foliage. They usually leave the plant to pupate. There may be 3 generations per year. Damage causes a loss in quality and yield (fig. 5). Some injury can be tolerated in cabbage before heading begins and on broccoli or cauliflower foliage. Eggs and larvae can be monitored visually. Several natural enemies attack imported cabbageworms. Eliminating unnecessary sprays and using the biological insecticide, *Bacillus thuringiensis*, helps preserve these natural enemies.

**Cabbage loopers** can also be a serious foliage pest of cole crops. They do not overwinter in Michigan. Adults (fig. 6) may migrate into Michigan as early as June, but often don't arrive until July or August. Hosts of the cabbage looper include cole crops, celery, tomatoes, and potatoes. Eggs are laid singly on the underside of the foliage. Larvae (fig. 7) are green with a white stripe. They do not have legs on the middle segments of their bodies and move in an inchworm fashion (thus the name "loopers"). They cause foliar injury and can be a contaminant at harvest for cole crops, celery and tomatoes. Cabbage loopers are more difficult to control with insecticides than imported cabbageworms, so correct identification of the larvae is important. Loopers can be monitored visually, and adults can be monitored with pheromone (sex attractant) lures and traps.

**Diamondback moths** may overwinter in Michigan or may arrive on transplants from the south or migrate into the state. Adults are small moths, with wings held tent-shaped over their backs (fig. 8). Larvae (fig. 8) are less than 1/2-inch long when full grown — much smaller than either imported cabbageworms or cabbage loopers. They have a forked rear end and move very rapidly when disturbed or held in your hand. Larvae pupate on the foliage in white silk cocoons (Fig. 8). Feeding of diamondback moth larvae often only goes part way through the leaf and may leave a "windowpane" of transparent tissue. Like the cabbageworms and loopers, they can cause foliar injury and contaminate the product. Diamondback larvae and pupae can be monitored visually. Adults can be monitored with pheromone (sex attractant) lures and traps.

Diamondback moth adults and larvae can be highly resistant to insecticides. A tiny wasp parasitizes diamondback larvae and may kill 70 to 80% of them. Spraying with the wrong insecticides may kill the natural enemies but not control the resistant diamondback moth larvae. *Bacillus thuringiensis* insecticides generally control the diamondback moth larvae and do not kill the wasps.

**Flea beetles** (not shown, 1/16 - 1/8-inch long, black or brown) chew small holes in foliage and can injure young transplants. They have large hind legs and jump when disturbed. Adults overwinter in the soil and emerge early in the spring to feed and lay eggs. Larvae feed on plant roots and can seriously injure root crops such as radishes and turnips. Flea beetles can be monitored by looking closely at foliage.

**Cabbage aphids** (fig. 9) overwinter as eggs on cole crop residue. They may be present in the fields during the summer but are most common late in the fall. High aphid numbers can cause leaves to cup and curl. **Onion thrips** (1 mm long, brown or tan, fig. 10) attack many crops and weeds, including cole crops. In cabbage, damage to the leaves (fig. 11) or the presence of thrips inside the head may make them unmarketable.

For insecticide recommendations, commercial growers should consult MSU Extension bulletin E-312, *Control of Insects, Diseases and Nematodes on Commercial Vegetables*. Home gardeners, consult bulletin HYG-001, *Home Insect Pest Management Guide*.

Thanks to Art Wells and Don Cress for their contributions to earlier versions of this bulletin.

# Cole Crop Pests



1. Cabbage maggots and damage to roots



2. Cabbage maggot (left: damaged plant; right: healthy plant)



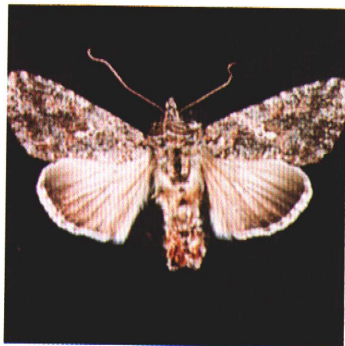
3. Imported cabbageworm adult



4. Imported cabbageworm larva



5. Imported cabbageworm and looper damage (undamaged head on right)



6. Cabbage looper adult



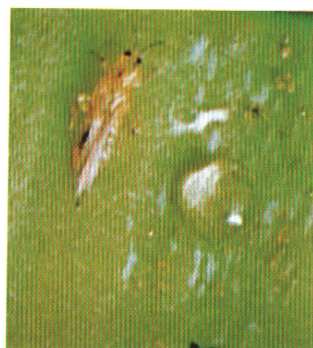
7. Cabbage looper



8. Diamondback moth (adult left, larva center, cocoon containing pupa right)



9. Cabbage aphids (left) and damage (right)



10. Onion thrip



11. Onion thrip leaf damage