FACT SHEET Lincoln University Cooperative Extension • Integrated Pest Management Program

The Pest Caterpillars of Cole Crops in Missouri I: Identification and Life Cycle

"Cole crops" is a general term used to describe several vegetables in the mustard family, including broccoli, Brussels sprouts, cabbage, cauliflower, collards, kale and kohlrabi.

The three caterpillar species discussed in this fact sheet are commonly referred to as "the caterpillar pest complex of cole crops." They are usually managed collectively.

Dr. Roshan Manandhar
Postdoctoral Fellow
Sustainable Pest Management Systems
Integrated Pest Management (IPM) program and
Dr. Jaime Piñero
State Extension Specialist–IPM

900 Chestnut Street, Allen Hall
Jefferson City, MO 65101
(573) 681-5543

LUCE FS#18-F-2015
12/08/2015

Introduction

The diamondback moth, *Plutella xylostella* (Lepidoptera: Plutellidae), imported cabbageworm, *Pieris rapae* (Pieridae), and cabbage looper, *Trichoplusia ni* (Noctuidae), have consistently been identified as key insect pests of cole crops in most areas of the U.S., including the Midwest. The first two species are diurnal, which means they are active during the day, while the third species is nocturnal (active at night). The direct damage to the crop is caused by the larvae (see page 2) feeding on the marketable leaves and flower heads. The presence of larvae or frass (excrement or other debris from insects) on the produce reduces its marketability.

Identification and Life Cycle

Diamondback moth

Adult: Adults are slender, grayish-brown moths, around 1/4 inch in length, with pronounced antennae. Moths are marked with a broad, cream or light brown band along the back. This band is sometimes constricted to form one or more light-colored diamonds. Adult moths can live as long as eight weeks. Their average life span is two weeks. Adults can be found resting on foliage during the day. They become more active just before dusk, when most mating and oviposition (egg laying) occurs. A single female can deposit as many as 350 eggs in a 10-day period.

Egg: Eggs are oval, flattened, tiny and yellow or pale green. They are deposited singly or in clusters of two to eight. They are usually laid in a depression on the surface of foliage.

Larva: The larval stage of the diamondback moth includes four instars (stages of development). The first instars are colorless to pale white, with a dark head capsule. Later, instars turn green.

Pupa: Pupae (inactive immature form between larva and adult) change from yellow to brown as the insect develops into an adult.

Imported cabbageworm

Adult: The adult butterfly has a wingspan of 1.5-2.5 inches. Both males and females have white forewings, with black at the tips. Males have one black dot in the center of the wing; females have two. Adults typically live for about three weeks. During this period, each female produces 300 to 400 eggs. The adult is very active in the daylight. It will often move from the crop to flowering weeds to feed.

Egg: Eggs are bullet-shaped. They are laid singly, usually on the lower surface of the outer leaves. The eggs are visible and are initially pale white. Eventually, they turn yellowish.

Larva: The larval stage includes five instars. The first instars are 1/8 inch long. At the final instars, they reach a maximum length of 1.2 inches. The larva is green and appears velvety. Larvae chew large, irregular holes in leaves. They also bore into flower heads and drop greenish-brown fecal pellets that ruin marketable produce. All larval stages except the first instar bear a narrow yellow line running along the center of the back. This stripe is sometimes incomplete on the early instars.

Pupa: Pupation normally occurs on the food plant or in nearby debris. Pupae are usually yellow, gray, green or speckled brown.

Cabbage looper

Adult: The moths have a wingspan of nearly 1.5 inches. The forewings are mottled gray-brown in color. The hind wings are light brown at the base.

Egg: Cabbage looper eggs are visible half circles, with the flat side stuck to the foliage. The eggs are deposited singly or in clusters of six to seven, either on the upper or lower surface of leaves. Eggs are yellowish-white or greenish, with ridges running lengthwise.

Larva: The larval stage includes five instars. Young larvae are initially a dark color. They become pale green as they begin to feed on leaves. Larvae crawl by arching their backs to form a loop and then projecting the front section of their body forward. This is the basis for the common name of this insect. Loopers produce ragged holes in leaves and bore through flower heads. They contaminate heads and leaves with frass. A mature larva is 1.2-1.6 inches long. It is mainly green, usually with a distinct white strip on each side.

Pupa: Pupation takes place on the underside of leaves, in plant debris or between soil clods. Pupae change from an initial green to dark brown or black. They are about 0.8 inch in length.

Egg	Larva (plural: larvae)	Pupa (plural: pupae)	Adult
Diamondback moth, *Plutella xylostella*			
1 	2 	3 	4 
Imported cabbage worm, *Pieris rapae*			
5 	6 	7 	8 
Cabbage looper, *Trichoplusia ni*			
9 	10 	11 	12 

References

Capinera, J. L., 2001. *Handbook of Vegetables Pests*. Academic: New York, NY.

Philips, C. R., Fu, Z., Kuhar, T. P., Shelton, A. M., and Cordero, R. J., 2014. "Natural History, Ecology, and Management of Diamondback Moth (Lepidoptera: Plutellidae), with Emphasis on the United States." *Journal of Integrated Pest Management* 5, 3.

Talekar, N. S., and Shelton, A. M., 1993. "Biology, Ecology, and Management of the Diamondback Moth." *Annual Review of Entomology* 38: 275-301.

Photo credits

1,9,11. Whitney Cranshaw, Colorado State University, Bugwood.org; 2. Clemson University – United States Department of Agriculture (USDA) Cooperative Extension Slide Series, Bugwood.org; 3, 4. Alton N. Sparks, Jr., University of Georgia, Bugwood.org; 5, 8. David Cappaert, Michigan State University, Bugwood.org; 6, 7. Russ Ottens, University of Georgia, Bugwood.org; 10. R. J. Reynolds Tobacco Company, Bugwood.org; 12. Keith Naylor, Bugwood.org