Cole Crops XXIII (Leafy Brassicas)

Caterpillars

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Cabbage Looper

Diamondback Moth

Cabbage looper (*Trichoplusia ni*)
Imported cabbageworm (*Pieris rapae*)
Southern cabbageworm (*Pontia protodice*)
Diamondback moth (Xylostella maculipennis) and others.

Identification (and life cycle/seasonal history)

Several different caterpillars commonly infest brassica crops in the region. The cabbage looper is the larva of a night-flying cutworm-type moth. It is generally green, with fine white markings, and has only three pairs of prolegs on the abdomen, causing it to walk in a looping manner.

The imported cabbageworm is the larva of the common **cabbage white butterfly**. Larvae are dark green and slightly fuzzy. A related species is the southern cabbage worm. Caterpillars are brightly patterned with yellow and black. The adult, known as the **checkered white**, is similar to the cabbage butterfly but has more dark markings on the wings. It is generally restricted to the southern High Plains, but may range further north following warm winters.

The smallest of the caterpillars affecting crucifers is the diamondback moth. The adults are small moths which have a row of white diamond markings when the wings fold. Larvae are light green and highly active, readily dropping from the plant when disturbed.

Eggs of all the above species are laid singly on leaves, or in small groups rather than as masses. Eggs of those that are moths (cabbage looper, diamondback moth) lay eggs at night; eggs of butterflies (imported cabbageworm, southern cabbageworm) are laid during the day. Larvae feed on leaves, originally producing shallow 'window-pane' feeding injuries, but then become more general feeders. Late stage larvae of cabbage

loopers and imported cabbageworm tend to burrow into the head of plants. Pupation can occur on the plant or, most often, a few feet away. Loose cocoons of silk surround the pupa of the moths whereas butterflies produce naked green pupa that are attached to the plant by a small mat of silk.

There are multiple generations of all species and they can be found throughout much of the growing season. Diamondback moth is found very early, and develops on many wild winter annual mustards in late winter and early spring.

Plant Response to Damage

All the caterpillars feed on the foliage of plants. Low levels of defoliation to non-marketed plant part, such as wrapper leaves, do not cause significant injury. However, in high populations they can reduce head development and their droppings soil the heads. Later stages of some caterpillars, notably cabbage looper and imported cabbageworm, tunnel directly into the marketed heads and cause serious damage.

In many growing areas of North America insecticide resistant strains of diamondback moth are present. These have not been documented in the High Plains.

Management Approaches

Natural Controls

There are numerous natural enemies that control cabbage 'worms'. All have several types of parasites - parasitic wasps and/or tachinid flies that help reduce populations. They are also susceptible to the many general predators that can be found in fields such as damsel bugs and minute pirate bugs. Where present, the European paper wasp can be a very important natural enemy.

All the caterpillars are susceptible to the bacterial disease *Bacillus thuringiensis*. Diamondback moth is fairly resistant to the *kurstaki* strain, but other strains are available that have more activity against this species.

Chemical Control

Addition of a wetting agent is recommended with most insecticides to improve coverage on waxy leaves.

Product List for Caterpillars on Leafy Brassicas:

Insecticide	**(Fl. oz. or oz. product)**	**Preharvest Interval, Remarks**
Foliar Treatments Allowable for Certified Organic Production		
Bacillus thuringiensis var. *kurstaki* (Biobit, Dipel,		0 day PHI, 4 hour reentry. *Bacillus thuringiensis* (Bt)

Javelin) Bacillus thuringiensis var. aizawai (XenTari, Agree)		products have stomach poison activity and must be ingested. Feeding stops very soon after exposure; death may take a couple of days. *Aizawai* strain is most effective against diamondback moth. *Many, but not all, Bt formulations allow use in* ***Certified Organic*** *production*
Entrust	1-2 oz/A	1 day PHI, 4 hour reentry. Naturalyte insecticide (spinosyns). Lower rate indicated for diamondback moth. Allowed for use in **Certified Organic** production.
Diatect V	3-6 lbs/A	12 hour reentry. Dust/WP formulation of a pyrethrins/diatomaceous earth combination. Allowed for use in **Certified Organic** production.
	Foliar Applications	
Ambush, Pounce, Permethrin 3.2E, Perm-Up	as labeled	1 day PHI, 12 hour reentry. Labelled for *collards and turnips only.* Various formulations of the pyrethroid insecticide permethrin. **Restricted Use** because of extreme toxicity to aquatic organisms.
SpinTor, Success	3-6 fl. oz./A	1 day PHI, 4 hour reentry. Naturalyte insecticide (spinosyns). Lower rate indicated for diamondback moth.
Intrepid	4-8 fl. oz.	1 day PHI, 4 hours reentry. An insect growth regulator (methoxyfenozide). Labeled for suppression only against diamondback moth.
Mustang/Fury	2.4-4.3 fl. oz./A	1 day PHI, 12 hour reentry. Pyrethroid insecticide (zeta-cypermethrin). **Restricted Use** because of extreme toxicity to aquatic organisms.
Sevin, Carbaryl	as labeled	14 day PHI for *collards, kale and mustard greens only*. 12 hour reentry. Several formulations of

		carbaryl (carbamate insecticide) are available.
Confirm 2F	6-8 fl. oz./A	7 day PHI, 4 hour reentry. Insect growth regulator insecticide (tebufenozide). Death requires a few days but feeding ceases shortly after exposure.
Endosulfan (Phaser, Thiodan, Thionex, etc.)	as labeled	21 days, 24 hour reentry. *Labeled for collards and mustard greens only*. Chlorinated hydrocarbon insecticide (endosulfan).

Categories: Cole Crops, Leafy Brassicas, Insects, Caterpillars

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