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Biology and management of cutworms and armyworms in table beets

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The larvae of three species of moths are pests of processed table beets in western Oregon. The larvae of the bertha armyworm *(Mamestra configurata)* and the variegated cutworm *(Peridroma saucia)* feed primarily on beet foliage. The black cutworm *(Agrotis ipsilon)* is a direct pest of beet roots.

Bertha armyworm

Description and life history

The bertha armyworm *(Mamestra configurata)* is native to western North America and occurs from California to British Columbia, east to the Canadian prairie provinces. It has a wide host range and is an occasional pest of table beets.

Like most cutworms, the bertha armyworm overwinters as a pupa in the soil. The adults emerge in April, and the females begin depositing eggs on crop plants and weeds in May.

The adult is a greenish-gray to gray moth with two spots on the front wings, a small round spot with a larger kidney-shaped white and gray spot on the middle of the wing, and a whitish band near the fringe of the wing.

The adults lay eggs in masses on the underside of leaves of beets or weeds in the field. They apparently prefer lambsquarters, which are typically taller than the beets at this time of year.

The eggs hatch in 4 to 8 days. The larvae then dangle from the plant by threads of silk until they reach other leaves or are blown by the wind to other plants, where they begin feeding.

Figure 1.—"Shot-holing" of leaf caused by young larvae of the bertha armyworm

Thus infestations of bertha armyworms tend to occur in patches fairly close to where the eggs were deposited. As the larvae grow through six stages, they chew "shot-holes" in the leaves of the beets (figure 1).

Bertha armyworm larvae are usually greenish-gray to brown with a light colored band on the side (figure 2). The larvae feed for about 6 weeks and then drop to the soil to pupate. Some of these pupae overwinter and the adults emerge the following year.

Some adults emerge from the ground during mid- to late July and begin a second generation in August. Damage caused by these larvae is noticeable in mid-August and September on beets that are harvested late.

Management practices

The bertha armyworm is usually not a serious problem by itself (it may be serious when it occurs with the variegated

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cutworm). Most of bertha armyworm damage to beet foliage occurs early in the season and on leaves that will have died by harvest time (see "Variegated cutworm," below). Good weed control should help to control this pest.

Insecticide control

Chemical control of the bertha armyworm is rarely necessary (but see "Variegated cutworm").

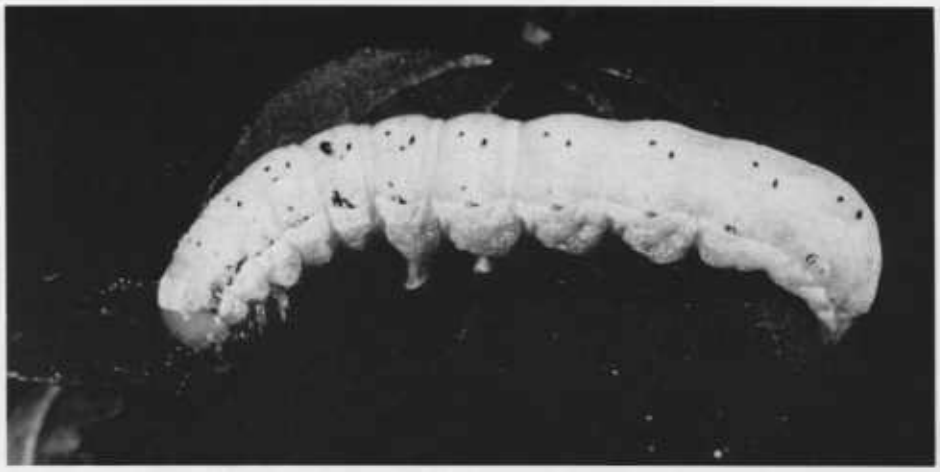

Figure 2.—Larva of the bertha armyworm

Variegated cutworm

Description and life history

The variegated cutworm *(Peridroma saucia)* is distributed throughout the United States. It feeds on 85 different host plants, including 37 vegetable crops on which it is a pest. It's not clear how this insect overwinters in our area. Both adults and pupae can be found during the winter, and it may overwinter as larvae as well.

The adult moth is a drab brown moth with two inconspicuous circles on the outer third of the front wings. Adults have been caught in pheromone traps every month of the year, with several distinct peaks of flight activity.

Adults flying during May and June arrive in table beet fields and begin to lay eggs by mid-June. The eggs hatch in about a week, and larvae feed on beet foliage through July.

The larvae of the variegated cutworm are brown, with 3 to 5 distinct yellow dots on the back behind the head. There are six larval stages. The first- through the fourth-stage larvae feed in the foliage of the beet plants.

The fifth- and sixth-stage larvae move down to the soil and feed at the surface, mostly on foliage but occasionally on the root as well. The feeding damage is similar to that of the bertha armyworm, characterized by a "shot-holed" appearance of the leaves (figure 1).

Unlike the bertha armyworm, the variegated cutworm doesn't usually feed in groups. It can build up to extremely high numbers in table beets. When the larvae complete feeding, they pupate in the soil.

New adults emerge 1 to 2 weeks later, depending on temperature. It's not clear if these adults start a new generation or overwinter until the next season.

Management practices

The variegated cutworm can become a problem in table beets when present in large numbers or in combination with the bertha armyworm. Like the bertha armyworm, the variegated cutworm places large numbers of eggs on weeds (mainly on pigweed), so good weed control should help in the overall management of this pest.

Large numbers of variegated cutworms can severely defoliate the tops of the beets late enough in the season to interfere with harvest. It's important to recognize the presence of this pest when you observe shot-holing in a field. If you discover larvae, and if damage is occurring, monitor the progress of the damage closely—and base your control decision on that progress.

Insecticide control

If necessary, carbaryl (Sevin) or Lannate provide good control of both variegated cutworm and bertha armyworm. Ground application of insecticides is preferred.

Black cutworm

Description and life history

The black cutworm *(Agrotis ipsilon)* occurs throughout the world and is a migratory insect. Adult moths migrate north as the weather warms in the spring. The adult is a brownish gray moth (2-inch wingspan) with a spot and a light silvery band on the front wings.

Adults migrate into the Willamette Valley in April and begin laying eggs. The arrival of the first adults is likely correlated with spring storms and strong southerly winds.

Migration and egg-laying continues into June—which overlaps the period of time when all of the beets are planted. Eggs are laid on beets early as the first

Figure 3—Wilted leaves of dead beet seedlings, a result of black cutworm damage below the soil surface

Figure 4—Black cutworm damage to roots of table beet seedlings (scarring and pitting)

true leaf stage. The eggs hatch in 3 to 7 days, depending on temperature.

The first-stage larvae are about 1/16 inch long and feed briefly on the foliage before molting and moving down into the soil. Larvae of the black cutworm are gray (with a lighter brownish stripe down the back), and they have a dark brown or black head. They're most easily collected in the soil.

This insect is often called a "subterranean" cutworm as older larvae move deeper into the soil, feeding on underground plant parts by day. Second- and third-stage larvae feed at the soil surface mostly at night.

On young beet plants, this damage results in wilted leaves or plants cut off at the crown, lying on the soil surface next to the row of healthy plants. Older larvae cut through roots, killing whole plants (figure 3).

Beet roots that are only slightly damaged when young will mature to be scarred or distorted or both (figure 4). Older beets aren't killed but are tunneled by large larvae. The black cutworm passes through the larval stages in about a month, growing to 1 inch long before pupating in the soil. Adults emerge about a week later.

The adults that emerge from beet fields in mid-summer may begin another generation in the fall after beets are harvested. Very few black cutworms survive the winter in western Oregon.

Management practices

Larvae of the black cutworm can be difficult to control with insecticides because of their subterranean habit. Satisfactory control is less likely as the larvae mature and as the beet plants grow and produce more and larger leaves, which prevent thorough spray penetration to the crown of the beet plants.

Thus it's very important to detect and treat the black cutworm as early as possible. Since it invades beet fields shortly after planting, early monitoring for its damage should begin when the beets are very young (about 2 inches high).

The wilted and cut plants and leaves are easy to see before the first cultivation. Plan to look for damage and apply insecticides before your first cultivation.

Insecticide control

Insecticides will control the larvae of the black cutworm. Control is enhanced by early application to younger cutworm larvae. Black cutworms become increasingly resistant to insecticides as they mature.

In addition, since the larger larvae feed deeper in the soil than the younger larvae, they're less likely to contact the

foliar-applied insecticides. As few as two or three cut plants or leaves within within 10 row feet of beets in several sites throughout a field warrant the application of an insecticide.

High label rates of carbaryl (Sevin) or Lannate before cultivation or before the plants are 5 inches tall have generally provided satisfactory control of black cutworm in field trials in commercial plantings.

Use pesticides safely!

- **Wear** protective clothing and safety devices as recommended on the label. **Bathe or shower** after each use.
- **Read** the pesticide label—even if you've used the pesticide before. **Follow closely** the instructions on the label (and any other directions you have).
- **Be cautious** when you apply pesticides. **Know** your legal responsibility as a pesticide applicator. You may be liable for injury or damage resulting from pesticide use.

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