



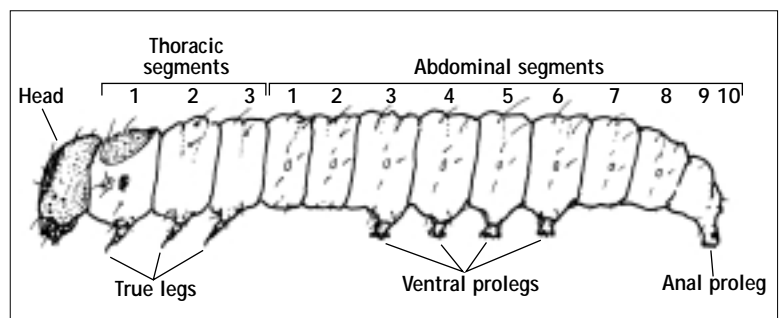
A Key to Common Caterpillar Pests of Vegetables

A.N. Sparks, Jr. and T.-X. Liu
Extension Entomologist and Research Entomologist
The Texas A&M University System

Caterpillars, the immature forms of butterflies and moths, are common pests of vegetable crops. Caterpillars attack plants throughout their development, and may attack almost any plant part, including stems, leaves and fruit. Caterpillars come in many sizes and colors. The ones featured in this publication range in size from less than $\frac{1}{2}$ inch to more than 3 inches long. Some caterpillars have smooth skins, while some have long, soft hairs and others are covered with short, stiff spines. Variation in all of these characteristics helps in identifying caterpillar species, and proper identification is the first step in any pest management program.

General caterpillar characteristics

Caterpillars have a worm-like body structure, with a well defined head, three thoracic segments, and ten abdominal segments. Each thoracic segment has one pair of true legs. The abdominal segments generally have three to five pairs of fleshy protuberances, called prolegs, on the bottom side. These are used for crawling. If there are five pairs of prolegs, four pair will be located on the 3rd, 4th, 5th and 6th abdominal segments (ventral prolegs) and one pair on the last segment (anal prolegs).



Other body structures used in identification include:

Setae: hairlike projections from the skin; most caterpillars have at least six primary setae on each side of the abdominal segments, although they may be inconspicuous; additional setae, if present, are called secondary setae and may be long and flexible or short and stout.

Figure 1. General structure of a caterpillar.

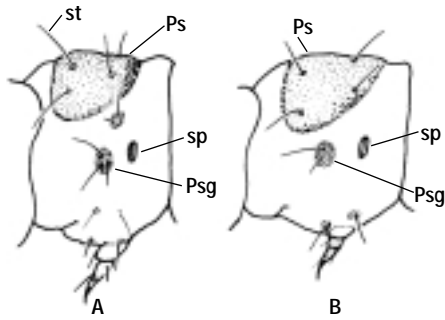


Figure 2. Generalized first thoracic segment of a caterpillar.

A—prespiracular group with three setae
 B—prespiracular group with two setae
 Psg=prespiracular group; st=setae;
 Ps=prothoracic shield; sp=spiracle

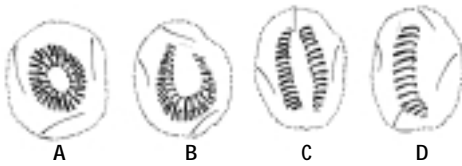


Figure 3. Common arrangement of crochets on prolegs.

A—complete circle
 B—semicircle
 C—two rows
 D—single row

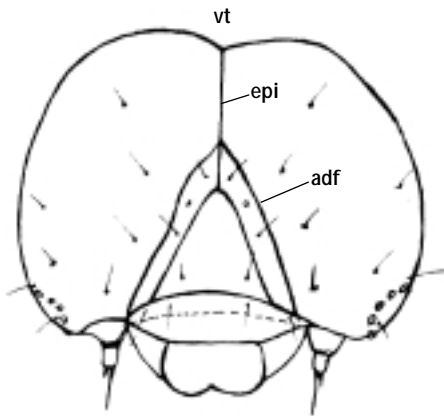


Figure 4. Head capsule of a caterpillar.
 vt=vertical triangle; epi=epicranial suture;
 adf=adfrontal suture

Prothoracic shield: a darkened plate on top of the first thoracic segment in some species.

Spiracles: tiny openings for breathing, located on the side of the first thoracic and each abdominal segment.

Prespiracular group: a group of setae on the first thoracic segment immediately in front of the spiracle; the number of hairs in this group helps separate related groups of caterpillars.

Pinaculum: a small, flat, hardened area of skin from which one or more setae arise; the prominence, color, size and location are important characteristics of the pinaculæ.

Crochets: small, hooklike structures at the ends of the prolegs; lengths and arrangement of the crochets are important characteristics.

Adfrontal sutures, epicranial suture and vertical triangle: the adfrontal and epicranial sutures appear as grooves in the “face” of the caterpillar. The vertical triangle is the area where the epicranial suture reaches the edge of the head capsule. The proximity of the juncture of the adfrontal and epicranial sutures to the vertical triangle is used in separating armyworms and cutworms.

Using the key

The key will help you identify the most destructive and most common caterpillar pests in vegetables. The key is intended for use only with these species. Many other occasional or incidental pests may be encountered, so you should always verify an identification by checking descriptions, host plant associations, and distribution in this publication and elsewhere. Using the key requires some familiarity with basic caterpillar structure as described above. You will need magnification to see some characteristics. It may be useful to preserve or dissect larvae before examining them. Some characteristics vary with the age of larvae; in general, this and other larval keys are meant to be used with older, larger larvae.

In using the key, always start with the first paired descriptions. Select the description that fits the caterpillar you are examining. At the end of the description the key will identify the caterpillar or indicate which paired description to evaluate next. Once the caterpillar has been identified, check the more detailed description and pictures after the key to verify the identification.

Key to Common Caterpillar Pests on Vegetables

- 1 Body has numerous long setae arising from clumps on each segment; crochets on ventral prolegs in straight line and longer in the middle of each line2
 Body does not have long secondary setae; if secondary setae are present they are short and stout3
- 2 Brown head; yellowish to reddish-brown bodySaltmarsh caterpillar
 Dark head; body black or banded black and reddish brownWoollybear caterpillar
- 3 Body has numerous short secondary setae arranged in four to six bands across each segment4
 Few if any secondary setae; body may appear hairless5
- 4 Velvety, green larva with a narrow, yellowish, longitudinal stripe on the dorsum and a broken, yellowish stripe on each sideImported cabbageworm
 Purplish-green larva with greenish-yellow stripes*Ascia monuste* and related species
- 5 Distinct dorsal horn near the end of the abdomen; full-grown larva > 2 inches longHornworms
 No dorsal horn on abdomen; full-grown larva < 2 inches long6
- 6 Two pairs of ventral prolegs on the 5th and 6th abdominal segmentsLoopers
 Four pairs of ventral prolegs on the 3rd through 6th abdominal segments7
- 7 Crochets on ventral prolegs arranged in two rows perpendicular to the length of larva; crochets on anal prolegs in a single perpendicular row; larva nearly white with brownish head; head smaller than thoraxSquash vine borer
 Not as above8
- 8 Large, smooth, green caterpillar with black bands interrupted by yellow spots running across each segmentParsleyworm
 Not as above9
- 9 Prespiracular group on prothorax has three setae; crochets on ventral prolegs arranged in a circle or semicircle; larvae < 3/4 inch long10
 Prespiracular group on prothorax has two setae; arrangement of crochets is variable12
- 10 Prothoracic shield a uniform and nearly black colorPotato tuberworm
 Prothoracic shield light colored or with only a dark margin11
- 11 Prothoracic shield has a dark posterior margin; larva usually has purplish markings; setae light coloredTomato pinworm
 Prothoracic shield uniformly light colored; fairly conspicuous erect, dark setae on all segments including the headDiamondback moth
- 12 On 4th abdominal segment the 3rd, 4th and 5th setae are arranged singly above, behind and below the spiracle(Noctuidae)...13
 On 4th abdominal segment the 3rd seta is above the spiracle and the 4th and 5th below the spiracle(Pyralidae/Crambidae)...19
- 13 Skin covered with tiny spines (seen only under magnification)14
 Skin smooth or covered with tiny, blunt bumps that may give it a pebbly appearance15
- 14 (requires microscopic examination of 3rd instar or larger)
 Tiny spines of skin present on less than 1/4 the height of tubercles of abdominal segments 1, 2 and 8; mandibles lack tooth on inner surfaceTomato fruitworm
 Tiny spines of skin present at least halfway up the tubercles of abdominal segments 1, 2 and 8; mandible has large tooth on inner surfaceTobacco budworm



Figure 5. Caterpillar with many long, secondary setae.



Figure 6. Caterpillar with short, stout, secondary setae.



Figure 7. Caterpillar without secondary setae. Primary setae (six per segment on the abdominal segments) may or may not be conspicuous.

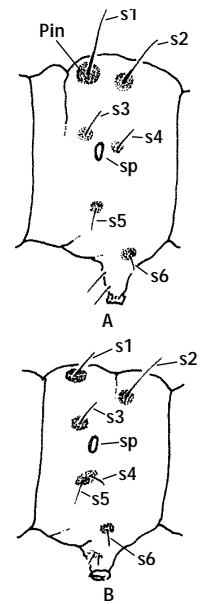


Figure 8. Location of primary setae on the 4th abdominal segment of Noctuidae (A) and Pyralidae/Crambidae (B) caterpillars.
 sp=spiracle; s1 to s6=seta 1 to seta 6; Pin=pinaculum



Figure 9. Head capsule of an armyworm. Adfrontal sutures meet epicranial suture well below the vertical triangle.



Figure 10. Head capsule of a cutworm. Adfrontal sutures meet epicranial suture near the vertical triangle. The dark arches are characteristic of the variegated cutworm.

- 15 Adfrontal sutures reach the epicranial suture near the vertical triangle.....Cutworms
Adfrontal sutures reach the epicranial suture well below the vertical triangle.....16
- 16 Mandibles lack conspicuous teethArmyworm
Mandibles have conspicuous teeth17
- 17 Dorsal pinacula large and conspicuous; distinct prothoracic shield with one median and two lateral light lines; no large, dark spots on sidesFall armyworm
Dorsal pinacula small and inconspicuous; large, dark spot on side of 2nd thoracic or 1st abdominal segment.....18
- 18 Large, dark spot near spiracle of 2nd thoracic segment; dorsum has many thin, wavy linesBeet armyworm
Large, dark spot near spiracle of 1st abdominal segment; dark, triangular markings (pointing toward midline) on dorsal abdominal segments with bright yellow to cream colored line below on side of bodyYellow-striped armyworm
- 19 Larva has nine brownish to purplish, longitudinal lines crossed by broad brown areas, giving a banded appearanceLesser cornstalk borer
Larva does not appear banded; has distinct longitudinal lines, spots, or no markings20
- 20 Larva has distinct longitudinal lines21
Larva has distinct spots (pinacula) or no distinct markings23
- 21 Greenish larva has white longitudinal stripes on the dorsumMelonworm
Larva has brown to purplish longitudinal stripes on the dorsum22
- 22 Five prominent brown to purplish stripes on the dorsum; dark headCabbage webworm
Four purplish-red stripes on the dorsum; orange-brown or reddish head.....Mexican rice borer
- 23 Prothoracic shield not distinct or light colored24
Prothoracic shield distinct, usually brown26
- 24 Prothoracic shield uniformly light colored; a single dark spot at the back margin on each side of the headPickleworm
Prothoracic shield not distinct or with dark spots; head has multiple spots or is speckled25
- 25 Head has multiple small, brown spots; 2nd thoracic segment has a black spot on the side; prothoracic shield has a dark spotHawaiian beet webworm
Prothoracic shield not distinct; pinacula above spiracles deeply pigmented; pinacula below spiracles have light colored centersGarden webworm
- 26 Mandible has four sharp and two rounded teeth; sharp point at base of 1st tooth; dorsal abdominal pinacula closest to midline are large, conspicuous and close togetherSugarcane borer
Mandible has four teeth and rounded edge or five teeth; dorsal abdominal pinacula closest to midline are separated by at least half their individual width27
- 27 Mandible has five teeth; dorsal abdominal pinacula closest to midline are about the same distance apart as their individual widthEuropean corn borer
Mandible has four distinct teeth and a rounded, serrated cutting edge; dorsal abdominal pinacula closest to midline are about as far apart as half their individual widthSouthwestern corn borer

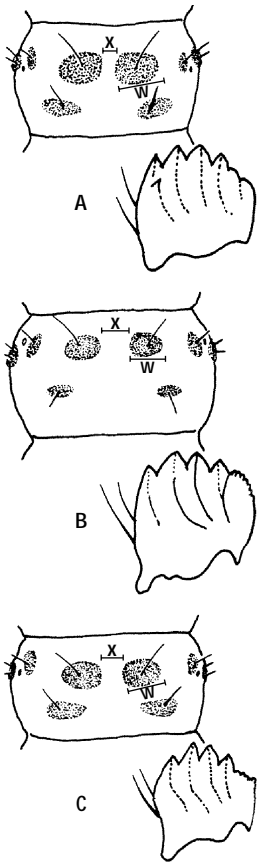


Figure 11. Mandibles and arrangement of pinaculae on the dorsum of abdominal segments of common borers.

- A—sugarcane borer ($x < 1/2w$)
- B—European corn borer ($x = w$)
- C—southwestern corn borer ($x = 1/2w$)

Family Arctiidae

Larvae have long secondary setae that give them a very hairy appearance. The head is usually smooth. The four pairs of ventral prolegs have crochets arranged in a single straight line, with longer crochets in the middle of each line.

Saltmarsh caterpillar, *Estigmene acrea*

Full-grown larvae are about 2 inches long. Larvae appear reddish brown, with yellow to brown bodies covered by short bristles and long, whitish secondary setae. The head capsule is yellowish brown. This species occurs on many vegetable crops and is a defoliator. Although infestations are generally localized, occasionally large populations can develop throughout a field.

Banded woollybear, *Pyrrharctia isabella*

Full-grown larvae are about 2 $\frac{1}{4}$ inches long. The body is covered with dense tufts of stiff hair. The larva is reddish brown with black at both ends. Although fairly common in garden and ornamental plantings, this species rarely is of economic concern.

Family Pieridae

The body segments of larvae are distinctly ringed, with each segment appearing to have four to six subsegments. Numerous short, secondary setae with distinct pinacula occur in a row on each subsegment, giving larvae a somewhat velvety appearance. Larvae have four ventral prolegs with crochets arranged in a straight line parallel to the midline.

Imported cabbageworm, *Pieris rapae*

Full-grown larvae are about 1 inch long and velvety green; they have a narrow, yellowish, longitudinal line on the dorsum and a broken, yellowish line on each side. Larvae feed on the foliage of vegetables in the cabbage and mustard family, including cabbage, cauliflower, collards, kale, kohlrabi, lettuce, mustard, turnip, and radish. This species has rarely been of economic importance in Texas.

Ascia monuste and related species

Full-grown larvae are about 1 $\frac{1}{4}$ inches long. Larvae are purplish green with two longitudinal, greenish-yellow stripes on each side and a narrow, greenish-yellow stripe on the dorsum. A related species lacks the stripe on the dorsum. A third species in this group is a yellowish larva with purplish longitudinal stripes. Larvae of all species feed on the foliage of cabbage, turnips and related crops. Populations are usually very scattered and numbers low, but this is a migratory pest and it can appear suddenly with many larvae per plant.



Figure 12. Saltmarsh caterpillar.



Figure 13. Woollybear caterpillar.



Figure 14. Imported cabbageworm (photo by Ricardo Bessin).

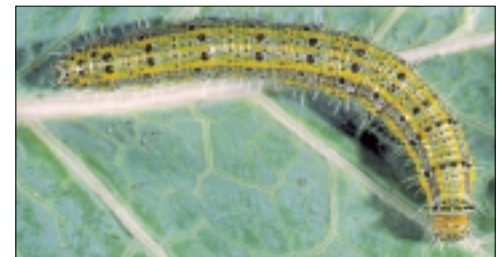


Figure 15. *Ascia monuste*.



Figure 16. Pieridae caterpillar.

Family Sphingidae

Larvae are large, plump, smooth, brightly colored, and lack conspicuous setae. The abdominal segments have six to eight wrinkles on the dorsal surface, giving the appearance of subsegments. The species common on vegetables have a distinct spine or horn on the dorsum of the 8th abdominal segment. Larvae have four ventral prolegs with crochets arranged in a straight line parallel with the midline. Hosts of both hornworm species include tobacco, tomato, eggplant, peppers and potato. Individual larvae can consume considerable foliage but populations are rarely large.



Figure 17. Tomato hornworm (photo by John Jackman).



Figure 18. Tobacco hornworm.

Tomato hornworm, *Manduca quinquemaculata*

Full-grown larvae are about 2 inches long. They are greenish to dark reddish brown with conspicuous, V-shaped, greenish-white marks on each abdominal segment. These marks point forward and somewhat down. The black spiracle is located inside the V-shaped mark near the point. The anal horn is green with dark marks on the sides and tip.

Tobacco hornworm, *Manduca sexta*

Full-grown larvae are about 3 1/2 inches long. They are green with conspicuous, greenish-white, diagonal lines above the spiracle on each abdominal segment. These marks slope up from the front toward the back of each segment. The oval spiracles on this species are light in color at the top and bottom. The anal horn is reddish.

Family Sessidae

Squash vine borer, *Melittia cucurbitae* and *M.alebaza*

Full-grown larvae are about 1 1/4 inches long. Larvae are creamy white with brownish heads and yellowish prothoracic shields. The head is smaller in diameter than the prothorax. The prespiracular group on the prothorax has three hairs. Larvae appear to lack prolegs, but actually have four pairs of ventral prolegs with two rows of crochets that run perpendicular to the midline of the body. The anal prolegs have a single perpendicular row of crochets. This species is a borer; it mainly attacks stems of squash, but will attack related species such as pumpkins, muskmelons, cucumbers and gourds.



Figure 19. Squash vine borer (photo by Bart Drees).



Figure 20. Parsleyworm (photo by John Jackman).

Family Papilionidae

Parsleyworm, Black swallowtail, *Papilio polyxenes*

Full-grown larvae are about 1 1/2 inches long, green to yellowish green, and have black lines interrupted by yellow or orange spots across each segment. The head has a similar color pattern. Most of the skin has few, if any, setae, but secondary setae are numerous on the four pairs of ventral prolegs. A defensive gland is located on the dorsum of the 1st thoracic segment. When extended it is

Y- or V-shaped; when retracted, the gland's location is marked by a groove. Host plants include celery, parsley, carrots and related plants. This species rarely reaches pest densities.

Family Gelechidae

Larvae are small. The prespiracular group on the prothorax has three setae. Primary setae are light colored and inconspicuous. Larvae have four ventral prolegs. Crochet arrangement varies.

Potato tuberworm, *Phthorimaea operculella*

Full-grown larvae are about 1/2 inch long. They are creamy white, greenish or pinkish white, with a very dark head, prothoracic shield and thoracic legs. Crochets on ventral prolegs are arranged in a complete circle; crochets on anal prolegs are in a band perpendicular to the midline. Tuberworm larvae burrow in leaves, petioles and stems of potato, tobacco, tomato, eggplant and related weeds. Larvae may also riddle tubers in the field or in storage. Their slender, silk-lined burrows are filled with excrement.

Tomato pinworm, *Keiferia lycopersicella*

Full-grown larvae are less than 3/8 inch long and yellowish green to purplish black, usually with purplish spots. The head is yellowish with a dark longitudinal line on each side. The yellowish prothoracic shield has a dark posterior margin. Crochets on ventral prolegs are arranged in a semicircle with the opening away from the midline. The primary host is tomato, but larvae will attack related plants such as potato and eggplant. Early instar larvae produce serpentine mines or blotches in leaves. Leaves may be folded and held together by silken threads, forming a shelter for older larvae. Larvae may complete development on leaves or enter fruit at any time after hatching; however, older larvae are most likely to attack fruit. They usually bore into fruit under the calyx. Fruit may be attacked at any stage of ripeness. Infested fruit are difficult to sort out, so larvae may contaminate the harvest. Leaf mining is seldom of economic importance.

Family Plutellidae

Diamondback moth, *Plutella xylostella*

Full-grown larvae are about 3/8 inch long. Larvae are pale green or cream colored with conspicuous, dark setae on all segments including the head. The prespiracular group on the prothorax has three setae. The prothoracic shield is uniformly light colored. Crochets on the four pairs of ventral prolegs are arranged in a complete circle. Hosts include cabbage, cauliflower, kale, mustard, radish, turnip and related species. Larvae feed on the undersides of leaves. Early instars may mine leaves or remove all but the upper surface of the leaf (windowpaning). Older larvae eat through the leaf, riddling foliage with small holes. Larvae also infest heads of cabbage, broccoli and cauliflower. When disturbed, they wiggle rapidly or drop from the plant and suspend from silken threads.



Figure 21. Potato tuberworm (photo by Jack Kelly Clark, University of California).



Figure 22. Tomato pinworm.



Figure 23. Diamondback moth.

Family Noctuidae

This group includes many species of economic importance. Larvae have primary setae only. The prespiracular group on the prothorax has two setae. Setae on the 4th abdominal segment are arranged with setae 3, 4 and 5 roughly above, behind and below the spiracle, respectively. Crochets on the ventral prolegs are arranged in a single row parallel with the midline. Other characteristics vary with species.



Figure 24. Cabbage looper.



Figure 25. Mandibles of soybean looper (A) and cabbage looper (B).



Figure 26. Tomato fruitworm/corn earworm.



Figure 27. Color variation within the tomato fruitworm.

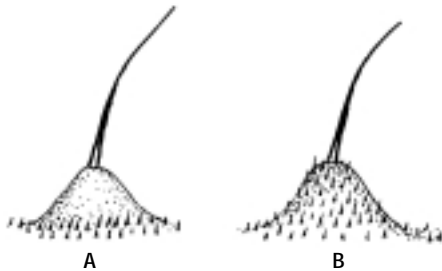


Figure 28. Appearance of cuticular microspines on the raised pinaculae on abdominal segments of tomato fruitworm (A) and tobacco budworm (B).

Cabbage looper, *Trichoplusia ni* Soybean looper, *Pseudoplusia includens*

Full-grown larvae are about 1½ inches long. Several species of loopers can occur on vegetables, but the cabbage looper is probably the most common, followed by the soybean looper. Both have ventral prolegs on the 5th and 6th abdominal segments and move with a looping motion. Larvae of both species are pale green to bluish green with white stripes on the top and sides of the body; the stripes may be very light. The soybean looper sometimes has black thoracic legs and pinacula. Larvae of these two species can be separated by examining the mandibles. The soybean looper has ridges on the inner surface of the mandible that terminate in secondary teeth before reaching the cutting edge. The cabbage looper lacks these secondary teeth. Both species have a wide range of hosts including cabbage, cauliflower, kale, turnips, lettuce, pea, potato and tomato. Larvae are foliage feeders. Early instar larvae feed from the bottom of the leaf, leaving the upper leaf surface intact, which results in windowpaning. Older larvae chew large, ragged holes in leaves.

Tomato fruitworm, Corn earworm, *Helicoverpa zea*

Full-grown larvae are about 1½ inches long. They vary greatly in color from light greenish yellow or pink to deep brown or nearly black on the dorsal surface. The ventral surface is usually light green or flesh colored. Larvae have prominent, dark tubercles. A key characteristic of this species is the dark microspines on the skin. The microspines can be seen only under magnification. This species differs from tobacco budworm in that the microspines are not present more than ¼ of the way up the tubercles (raised pinacula) on abdominal segments 1, 2 and 8, and the mandible lacks a tooth on the inner surface (these characteristics can be seen only on third instar or older larvae). This species attacks the foliage, stems, fruit or seed-bearing portions of a wide variety of plants. Hosts include corn, sweet corn, cowpeas, cotton, lima beans, tobacco, tomato, peppers and celery. In fruiting plants, larvae frequently prefer the fruit, and may attack fruit immediately after hatching. In leafy plants, larvae prefer younger leaves.

Tobacco budworm, *Heliothis virescens*

Larvae are similar in size and color to tomato fruitworm, but differ from fruitworm in that the microspines of the skin are present at least halfway up the tubercles on abdominal segments 1, 2 and 8, and the mandible has a large tooth on the inner surface (these characteristics can be seen only on third instar or older larvae). The

tobacco budworm does not attack as many plants as the tomato fruitworm, usually just cotton, tobacco and other solanaceous plants.

Cutworms, various species

Full-grown larvae of most species are about 1½ inches long. Most cutworm larvae are pale to dirty brown. They may be uniformly colored or mottled. Cutworms differ from armyworms and other related species in that the adfrontal sutures of the head reach the epicranial suture near the vertical triangle. In most cutworm species the skin is covered with microscopic bumps. A common species without these bumps is the variegated cutworm, which can be identified by the conspicuous dark arches on the head. Cutworms that attack vegetables generally hide in the soil or in plant debris on the soil surface during the day and feed at night. They usually cut off seedlings at or near the soil surface, and the first indication of cutworm problems is likely to be areas where all plants are missing. Locating cutworms in the daytime can be difficult; to verify cutworm damage you may need to examine damaged areas and collect larvae at night.

Armyworm, *Pseudaletia unipuncta*

Full-grown larvae are about 1½ inches long. Unlike most caterpillars, armyworm larvae lack teeth on the cutting surface of the mandibles. Larvae have greenish-brown heads with numerous dark reticulations and dark streaks. Color intensity varies greatly. The dorsum is greenish brown to black, with conspicuous paired dark markings. Each abdominal proleg also has a diagonal, dark band on the outside. Armyworms prefer grains and cereals. When populations are high and preferred hosts are consumed, larvae travel in large groups (armies) and consume most any plant they encounter.

Fall armyworm, *Spodoptera frugiperda*

Full-grown larvae are about 1½ inches long. Their cream to brown heads have dark reticulations. The prothoracic shield is brown with three light, longitudinal lines. The body is dark brown with multiple longitudinal lines of various colors including light brown, reddish brown, and yellowish. Pinacula are dark and conspicuous. Larvae are general grass feeders and a serious pest of sweet corn. They attack both the foliage and ears of corn.

Beet armyworm, *Spodoptera exigua*

Full-grown larvae are about 1¼ inches long. Color varies from light green to nearly black. The second thoracic segment has a small, dark spot near the spiracle. Other pigmentation may be obscured, but includes several thin lines on the dorsum and broader, alternating dark and cream or light green lines on the sides. The underside is generally pale. This species attacks many vegetables including beans, lettuce, onions, peas, peppers, potatoes, beets and tomatoes. Early instar larvae feed close together, generally on foliage. Older, larger larvae feed alone and can completely defoliate plants as well as bore into fruit.



Figure 29. Cutworm.



Figure 30. Armyworm.



Figure 31. Fall armyworm.



Figure 32. Beet armyworm.



Figure 33. Beet armyworm showing dark spot near the spiracle on the 2nd thoracic segment.



Figure 34. Color variation within the beet armyworm.



Figure 35. Yellow-striped armyworm.



Figure 36. Yellow-striped armyworm.

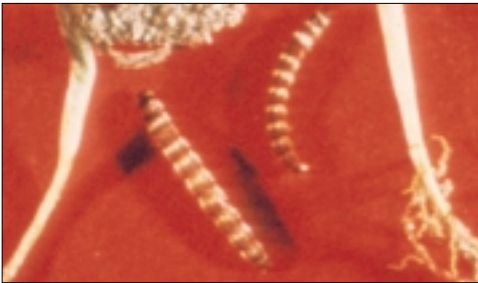


Figure 37. Lesser cornstalk borer.



Figure 38. Melonworm.



Figure 39. Pickleworm, young larva.



Figure 40. Pickleworm, last instar larva.

Yellow-striped armyworm, *Spodoptera ornithogalli*

Full-grown larvae are about 1½ inches long. Their color varies from pale gray to jet black. The head is usually brown with a distinct, white adfrontal area. The first abdominal segment has a dark spot near the spiracle. Most abdominal segments have dark, triangular markings on the dorsum pointing toward the midline. Below these dark markings is a bright yellow to cream colored longitudinal line, which gives this species its common name. Hosts include most common vegetables, grains, cotton, tobacco, peaches and other cultivated plants and weeds. This pest rarely occurs in densities that require treatment.

Family Pyralidae/Crambidae

This group contains many species of economic importance. Larvae are highly variable in appearance. They have few or no secondary setae. The prespiracular group on the prothorax has two setae. Setae on the 4th abdominal segment are arranged with seta 3 above the spiracle and setae 4 and 5 below the spiracle. Larvae have four pairs of ventral prolegs. Species included in this guide have crochets arranged in a complete circle.

Lesser cornstalk borer, *Elasmopalpus lignosellus*

Full-grown larvae are about ½ inch long. Larvae are greenish with abundant brownish stripes. The dorsum has many thin, brown, longitudinal stripes crossed by broad brown areas on each abdominal segment. Without magnification, this pattern and color combination make larvae appear banded and purplish. The underside of the larva is pale green. Larvae are very active when disturbed. Hosts include beans, corn, cowpeas, peas, peanuts, sorghum, turnips and other crops. Larvae are borers and attack plants near the soil surface. They are generally found in the plant or just below the soil surface inside a silken tube attached to the plant. They are most abundant in sandy or gravelly soil.

Melonworm, *Diaphania hyalinata*

Full-grown larvae are about 1 inch long and greenish to yellow. Earlier instar larvae are greenish with two slender, white stripes on the dorsum. In all instars the head is yellowish brown and does not have a dark spot on the sides, which distinguishes this pest from older pickleworm larvae. Hosts include cantaloupe, cucumber, squash, pumpkin and, rarely, watermelon. Larvae are primarily leaf feeders, but older larvae may enter fruit. This makes the fruit unmarketable and more susceptible to rotting fungi and other disease organisms.

Pickleworm, *Diaphania nitidalis*

Full-grown larvae are about 1 inch long and greenish to yellowish green without dark pinacula. Earlier instar larvae have distinct dark pinacula. In all instars the head is yellowish brown with a distinct dark spot on each side on the rear margin. Hosts include cantaloupe, cucumber, squash and watermelon. This pest does not occur on pumpkins. Larvae may feed on and in blossoms or buds

or bore into stems or leaf petioles. The greatest damage occurs when larvae bore extensively throughout the fruit.

Cabbage webworm, *Hellula rogatalis*

Full-grown larvae are about $\frac{5}{8}$ inch long. They are grayish yellow with five prominent, brown to purplish, longitudinal stripes on the dorsum. The head is dark brown to black. Hosts include beet, cabbage, cauliflower, collard, mustard, radish and turnip. Larvae attack the young leaves and hearts of plants. Except for the first instar, larvae cover the feeding area with a silk web on which feces and dirt collect.



Figure 41. Cabbage webworm.

Mexican rice borer, *Eoreuma loftini*

Full-grown larvae are about 1 inch long. Larvae are cream colored with four longitudinal, purplish-red stripes. The head is orange-brown or reddish. Larvae are borers and attack grass crops, including corn, sorghum, rice and sugarcane. This pest occurs primarily along the Gulf Coast.



Figure 42. Mexican rice borer.

Hawaiian beet webworm, *Spoladea recurvalis*

Full-grown larvae are about 1 inch long. Larvae are pale green with mostly inconspicuous pinacula. The head is light colored with distinct groups of round, brown spots. A prominent, dark pinaculum occurs on the side of the second thoracic segment. A dark spot also is present on each side of the yellowish prothoracic shield. Hosts include beets, cabbage, sugar beets, Swiss chard and spinach. Larvae feed on foliage and may or may not spin a web over the feeding area.



Figure 43. Hawaiian beet webworm.

Garden webworm, *Achyra rantalis*

Full-grown larvae are about 1 inch long and green to yellowish green. The head is yellowish with light speckling. The prothoracic shield is not well defined. The pinacula are prominent and uniformly dark above the spiracles. Pinacula below the spiracles have light centers. Hosts include alfalfa, beans, beets, cowpeas and peas. Larvae are foliage feeders and spin light webs over the leaves.



Figure 44. Garden webworm.

Sugarcane borer, *Diatraea saccharalis*

Full-grown larvae are about 1 inch long. There is both a summer and winter form; the main difference is the nearly complete loss of pigmentation of the prothoracic shield and pinacula in the winter form. Larvae are cream colored, with a rich brown head that merges to black near the mouthparts. The mandibles have four sharp and two rounded teeth, plus a short, sharp point at the base of the first tooth. The prothoracic shield and pinacula in the summer form are light brown to brown. The pinacula on the abdomen nearest the dorsal midline are large and separated across the midline by less than half their individual width. Larvae are primarily borers of grass crops, including corn, sorghum, rice and sugarcane.



Figure 45. Sugarcane borer.

European corn borer, *Ostrinia nubilalis*

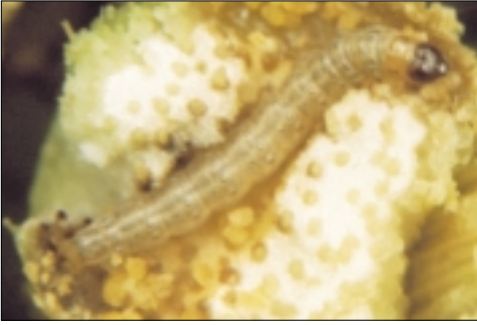


Figure 46. European corn borer.

Full-grown larvae are about 1 inch long and dirty white. Color on the dorsum varies from a smokey dark brown to light brown. The head is brown mottled with black. The mandibles have five teeth. The dark pinacula on the prothorax, from which the prespiracular group arises, has a dark spot on the side nearest the spiracle. The pinacula on the abdomen nearest the dorsal midline are separated across the midline by about the same distance as their individual diameter. Larvae are borers and attack plants such as beans, beats, celery, potatoes and corn. In corn, larvae will bore into any above-ground portion of the plant, including the ears. In Texas, this species occurs north of Lubbock.

Southwestern corn borer, *Diatraea grandiosella*



Figure 47. Southwestern corn borer.

Full-grown larvae are about 1 inch long. There is both a summer and winter form. The summer form is white or cream colored with blackish-brown pinacula. The pinacula are pale, smoky or yellowish in the winter form. The head is yellowish brown with brownish mottling. The prothoracic shield is pale yellow to brown with a row of dark brown markings near the anterior margin and a cluster of dark markings on each side. Mandibles have four distinct teeth and a rounded, serrated cutting edge. The pinacula on the abdomen nearest the dorsal midline are separated across the midline by about half their individual width. Larvae are borers in a variety of grass crops including corn, grain sorghum and sugarcane. They will infest all portions of a corn plant, including the ears.

Acknowledgments

Diagrams by T.-X. Liu

Photographs by A. N. Sparks, Jr.

Production of this publication was funded by the Texas Department of Agriculture through their IPM Grants Program.

Produced by Agricultural Communications, The Texas A&M University System

Extension publications can be found on the Web at:
<http://texaserc.tamu.edu>

Educational programs of the Texas Agricultural Extension Service are open to all people without regard to race, color, sex, disability, religion, age or national origin.

Issued in furtherance of Cooperative Extension Work in Agriculture and Home Economics, Acts of Congress of May 8, 1914, as amended, and June 30, 1914, in cooperation with the United States Department of Agriculture. Chester P. Fehlis, Deputy Director, Texas Agricultural Extension Service, The Texas A&M University System.

4M, New