Field Key to Larvae in Cotton

Richard Grantham
Director, Plant Disease and Insect Diagnostics Laboratory

Don C. Arnold
Retired Survey Entomologist

This key is designed to serve as a guide to identification of the more typical larvae of the common insect species found in Oklahoma cotton fields during the mid- and late-season. A 10 to 15 power hand lens will be most helpful in using this key. The identifying characters used are based upon those found on full-grown or nearly full-grown larvae and may not necessarily occur on newly hatched larvae. If the larva in question does not fit the proper description furnished, recheck the specimen with the key. If it continues to key out improperly or is not one of the species listed, and proper identification is desired, place the larva in a small bottle containing 70% alcohol and mail to: Department of Entomology and Plant Pathology, Oklahoma State University, Stillwater, Oklahoma 74078. Please do not send specimens for identification unless they are causing or suspected of causing damage to the crop. Please include information as to the type and amount of damage noted as well as the date and community where the larva was collected. This information will assist in getting a more accurate and rapid reply to your questions.

Some insects found in cotton fields cannot be identified with this key. This would include adult insects, arthropods other than insects, and such insects as corn leaf aphids and chinch bugs, which do not have a larval stage. Be sure you have insect larvae before attempting to use this key.

Occasional early season pests, such as cutworms, have not been included in the key as they are not normally serious in Oklahoma. If found, they should run to the last couplet in the chart, "species not included in the key." If they are causing serious damage, please send in specimens for identification.

This key should not be used for larvae occurring in crops other than cotton. Other keys are available for other crops and can be obtained from the local county Extension office.

Survey Methods

Insect counts in cotton are taken as the number per hundred terminals, squares, or bolls or the number per plant, depending on the species involved and the growth stage of the plants. You should walk diagonally across the field and check 100 plants, bolls, squares, or terminals. Counts can be reported on a percent basis.

Early season boll weevil counts are taken as the number of weevils per 100 linear feet of row. After squares form, 100 squares should be examined for punctures to determine the percent infestation. Both egg and feeding punctures should be counted.

Oklahoma Cooperative Extension Fact Sheets are also available on our website at:
http://osufacts.okstate.edu

Early season terminal counts for bollworms can be made by examining 100 mainstem terminals for eggs and worms. Report the average number of eggs and/or larvae observed per 100 plants. Late season boll counts are made by examining 100 polls. The feeding damage is computed as the percent injury.

Cotton leafworms and other leaf feeding larvae are reported as the percent of plants infested and the average number of larvae per plant.

Descriptions of Larvae

Bollworm (*Heliothis zea*)

The main distinguishing characteristic of this species is the distinct, short, sharp microspines, resembling whiskers, which are present between the longer hairs on the back. This gives the larvae an "unshaven" appearance when viewed with a 10X-15X hand lens. (Do not confuse the pebbled or granular skin of other larvae with the microspines.) The body color varies greatly from light to dark green, pink, or brownish-yellow. When fully grown, the larvae measures up to 1 1/2 inches in length. This destructive pest causes damage by feeding on the foliage, squares, and later boring into mature bolls.

Cabbage Looper (*Trichoplusia ni*)

These larvae move in a characteristic "looping" manner. They are larger at the back and taper toward the head. The body is green with narrow white lines running the length of the body and is without black spots. These larvae are up to 1 2/3 inches in length when fully grown. They are usually found feeding on leaves, giving the foliage a ragged appearance.

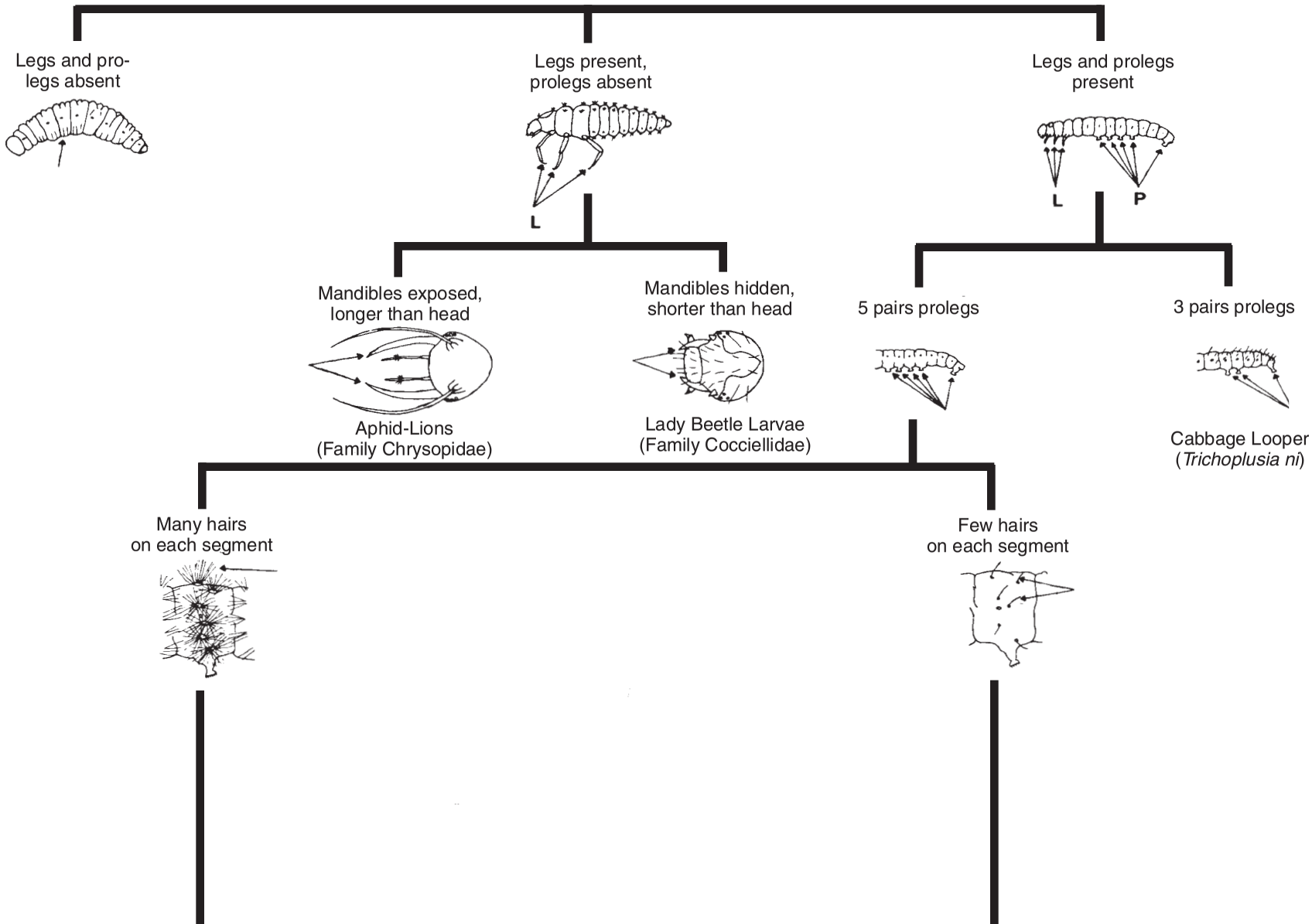
Pink Bollworm (*Pectinophora gossypiella*)

The body color is yellowish-white with broad pink bands around each segment giving the larvae an overall pinkish color. When fully grown, the larvae measure up to 1/2 inch in length. They may be found feeding in squares, rosetted blooms, bolls, or seeds. Positive identification cannot be made on field characters alone, so be sure to send in all suspected specimens.

Webworms (Several spp.)

This may be one of three closely related species, the garden webworm (*Achyra rantalis*), the alfalfa webworm (*Loxostege cereralis*), or the beet webworm (*Loxostege*

A Field Key to Some Common Larvae Found in Cotton in Oklahoma



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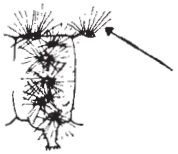
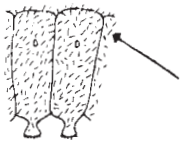
Body hairs long



Woolly worms
(Family Arctiidae)

Body hairs short



Cotton Square Borer
(*Strymon melinus*)

Microspines
not present

Microspines present
on back between hairs

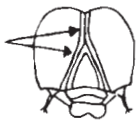
Bollworm
(*Heliothis zea*)

Head with large
black spots

Cotton Leafworm
(*Alabama argillacea*)

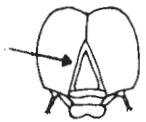
Head without large
black spots

With inverted "Y"
on front of head



Fall Armyworm
(*Spodoptera frugiperda*)

Without inverted "Y"
on front of head



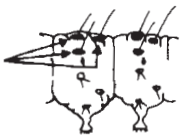
Pink or red in color

Pink Bollworm
(Pectinophora gossypiella)

or

Pink Scavenger Caterpillar
(*Pyroderces rileyi*)

Greenish, with 3 black spots
on side of each segment



Webworms
(*Loxostege* spp.)

Larvae not as described

Species not included
in the key

Prepared by
Horace W. Van
Cleave, revised
by Don C. Arnold,
Department of
Entomology and
Plant Pathology,
Oklahoma State
University.

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sticticalis), which can not be easily separated in the field. Although the control is the same, please send in specimens for identification to ensure accurate reporting. All of these larvae are greenish-yellow in color with three distinct, elongate, black spots arranged in a triangle on the upper portion of the side of each segment with the exception of the front three. The fully grown larvae measure about 1 inch in length. These larvae are foliage feeders and may move into alfalfa fields from other crops or weeds nearby. They usually spin webs over the leaves upon which they are feeding, hence the common name "webworms."

Cotton Square Borer (*Strymon melinus*)

These short, fat, green caterpillars are covered with short hairs which give them a velvety appearance, and are up to 1/2 inch long when fully grown. These caterpillares eat holes in cotton squares similar to those caused by the bollworm. In contrast to the bollworm, this species usually does not become a serious pest in the state due to natural control by predators and parasites.

Pink Scavenger Caterpillar (*Pyroderces rileyi*)

These larvae are pink to reddish in color and measure up to 1/3 inch when fully grown. They are primarily scavengers and occur in cotton bolls where other pests have caused the initial damage.

Cotton Leafworm (*Alabama argillacea*)

The body is generally yellowish-green and the head yellow with distinct black spots. The overall color may become darker during late season when it is sometimes almost black. The light forms have four equally spaced black spots (similar to 4 on dice) on the top of all segments. Each black spot is surrounded by a light colored ring. There are three longitudinal white lines on the top and one on each side of the body. The front pair of prolegs is smaller than the other four pairs and is sometimes overlooked. This is especially true in the early instars. These larvae measure up to 1 1/2 inches in length when fully grown. They are leaf feeders as their common name implies.

Fall Armyworm (*Spodoptera frugipedra*)

These larvae usually have a distinct, broad, white inverted "Y" present on the front of the head (not to be confused with a narrow inverted "V" found on a few other species). The body varies from light tan to green to dark brown or nearly black in color with three widely separated narrow yellowish-white stripes down the back. On each side are three more broad longitudinal lines side by side; the top, brown; the middle, reddish; and the bottom, yellow with reddish mottlings. These larvae measure up to 1 1/3 inches in length when fully grown. They are primarily foliage feeders.

Woolly Worms (Family Arctiidae)

This may be one of several members of this family. The most common one in the state is the salt-marsh caterpillar (*Estigmene acrea*), which is covered with long black, brown, or yellowish hairs. The larvae of this species may become almost 2 inches in length when fully grown. The pests in this family are primarily foliage feeders. If found causing serious damage, send in specimens for identification.

Boll Weevil (*Anthonomus grandis*)

These small, fat, wrinkled, legless grubs are up to 1/3 inch in length when fully grown. The body is yellowish-white in color. They are found feeding only inside squares and bolls. Any population detected should be reported to the Oklahoma Boll Weevil Eradication Program, the OSU Department of Entomology or the OSU Research and Extension Center at Altus, OK. The Boll weevil Eradication Program resulted in Oklahoma being declared as weevil free. If larvae or adults are detected, the Oklahoma Boll Weevil Eradication Program will initiate control measures.

Lady Beetle Larvae (Family Coccinellidae)

The body color is generally dark with bright yellow, orange, or red markings. The body is covered with numerous spines. In a few species, the body is covered with a waxy secretion and resembles mealybugs, but a check of the mouthparts will clear up the confusion. (Mealybugs have piercing-sucking or tube-like mouthparts, while lady beetle larvae have biting mouthparts.) The group is highly beneficial, with both the larvae and adults feeding on aphids, spider mites, eggs, and young of many pests.

Aphid-Lions (Family Chrysopidae)

These small, active, light brown larvae measure up to 1/2 inch in length when fully grown. Both the larvae (aphid-lions) and adults (lacewing flies) are beneficial, since they feed upon aphids, insect eggs, and small larvae. (Be sure that the specimen suspected of being in this group has biting mouthparts. There are several other groups, such as true bugs, Order Hemiptera, which are similar in body shape, but different from them by having piercing-sucking mouthparts.)

Issued in furtherance of Cooperative Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, the Director of Cooperative Extension Service, Oklahoma State University, Stillwater, Oklahoma. This publication is printed and issued by Oklahoma State University as authorized by the Vice President, Dean, and Director of the Division of Agricultural Sciences and Natural Resources and has been prepared and distributed at a cost of 20 cents per copy. 0413 GH Revised.