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THE
ALFALFA WEB WORM

BY C. E. SANBORN
DEPARTMENT OF ENTOMOLOGY

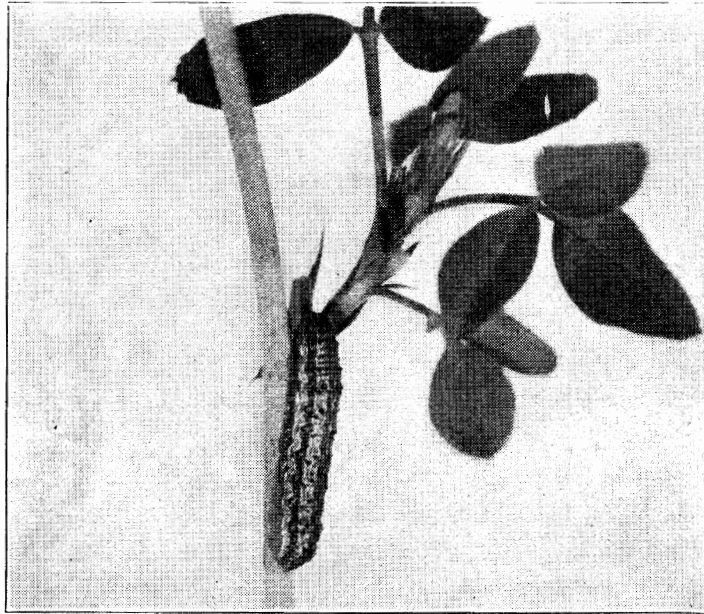


Figure 1—Alfalfa Web Worm
(*Loxostege similalis* Guen)

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THE ALFALFA WEB WORM

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Department of Entomology

HISTORY AND GEOGRAPHICAL DISTRIBUTION

This insect made its first appearance in farm crops during the year 1873. It occurs practically all over the United States and in South America. Like many other field crop pests, it has perhaps existed for many years in uncultivated lands on native plants, and as the more tender, succulent, cultivated plants have supplanted the native ones, it has adapted itself to the improved varieties to such an extent as to prefer them to the wild plants.

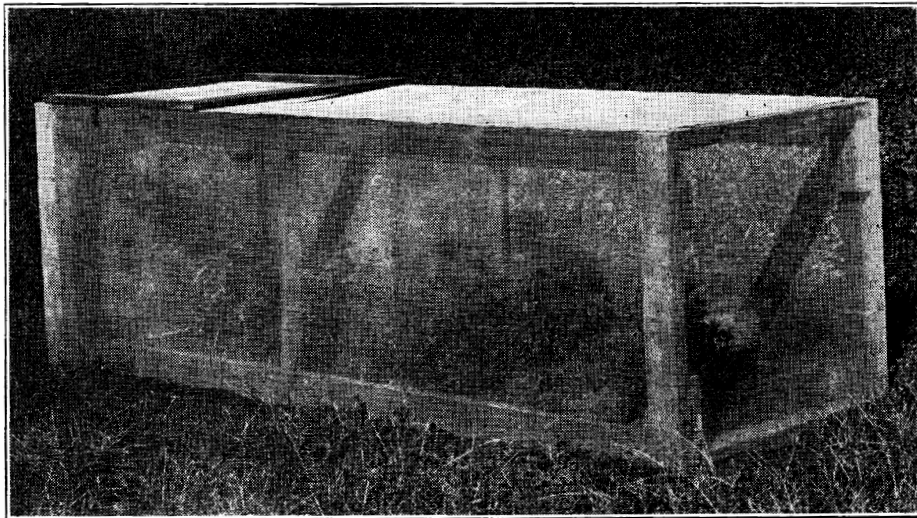


Figure 2—Cage of screen wire. Such cages as this were used in the study of the Web Worm

Biological History, Number of Broods per Year, Etc.

The alfalfa web worm passes through the winter in Oklahoma in the pupal stage. It is quite likely that further south, i. e., in Southern Texas, for instance, they may also pass the winter in the larval stage.

The adults emerge from these pupal forms and appear about the middle of April. This is the first brood of adults. The following or second generation appears about May 25; the third from June 28 to July 16; the fourth from July 27 to August 2; the fifth about September 16, and adult forms are present as late as November.

Development from Egg to Adult

The adults deposit eggs in masses generally on the ventral or lower side of the leaves of their food plants. Each mass contains from five to forty-two eggs, the average number being nineteen.

The **eggs hatch** ordinarily within three or four days. They are deposited mainly at night and they hatch mainly at night.

The **larvae** or **web worms** develop in about three weeks. During cool weather a longer time is required.

The **pupal** period during summer is ordinarily seven or eight days, but in hibernation it extends from about the middle of October until about the middle of the following April.

By noting the time of appearance of the adults or worms in the field, a person can quite definitely determine the time for the recurrence of the following broods. Although the dates given here are approximately accurate, they are not absolutely definite for every year, since seasonal conditions may be a little earlier or a little later one year than another year.

Feeding Characteristics of the Larvae

All broods except the last or fall brood are characterized by their web-spinning habit. Soon after hatching they attach a web to their food plant, much after the same fashion as the spring canker worm attaches a web to the limb of a tree for its protection. In case the worm is disturbed it can for protection throw itself from the plant, or if it becomes dislodged it can follow its strand of web back to its feeding place.

The web is also used for protection by concealment. At first the young worm generally attaches its web to the edges of a leaf across the dorsal or upper side, causing the two lateral edges to be drawn together. Meantime the green part of the leaf is devoured while the worm is protected on the underside by the leaf and on the upper side by its web. Thus fed and protected the worm grows and gradually feeds on other leaves and webs them together until the entire top of a single plant is webbed together and dwelt in by the worm which subsists on the "webbed-in" portion until it becomes full grown.

Under this same protection the web worm pupates and passes through the pupal stage, except the fall brood, from which the adult moth issues. Fields thus infested sometimes have the entire chlorophyll or green parts removed so that nothing is left except the fibrous or woody parts. Such fields have a faded green appearance and are almost valueless for hay purposes until another growth appears.

The last brood of web worms, with but few exceptions, do not spin webs and protect themselves by webbing the leaves together. Their only protection seems to consist of their ability when disturbed to quickly wiggle or twist between the leaves of the plant (similar to the cotton leaf caterpillar) to the ground at the base of the plant where they are not easily located. When full grown they burrow into the earth (pulling the hole in after them) and spin a web for the lining of their pupal cell, which is generally prepared by them about an inch below the surface of the soil. In this cell they transform to the pupal form and thus spend the winter.

It is stated by Professor E. Dwight Sanderson that when the larvae become full grown in mid-summer they descend to the soil and pupate in small silken cells on or just below the surface. It is also stated by Professor Sanderson that the moths appear in Texas in mid-April, but we would expect them to appear a month earlier in the southern part of Texas, since they appear in the latitude of Stillwater, Oklahoma, in mid-April.

The adults or moths do not seem to be possessed of great powers of flight. When flushed they do not ordinarily fly more than fifteen or twenty steps. Furthermore, they are rather delicate, i. e., when placed in confinement they live only a few days.

In view of these facts their powers of dissemination appear to be limited. In other words, if alfalfa were their only food plant and the alfalfa fields were separated to a distance of four or five miles, it is doubtful if the moth would normally infest as many fields as they now do.

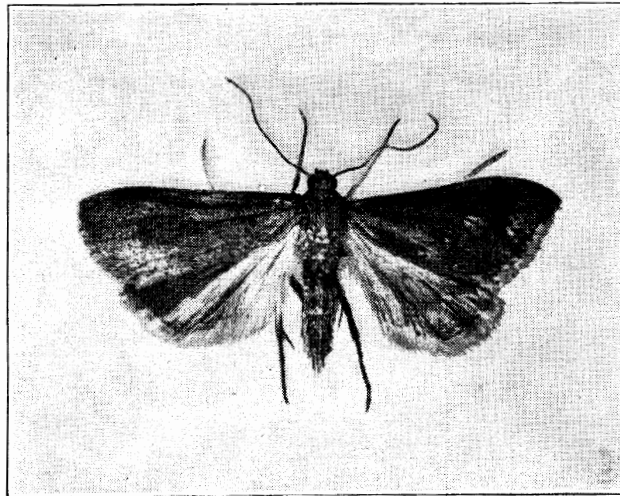


Figure 3—Adult Moth

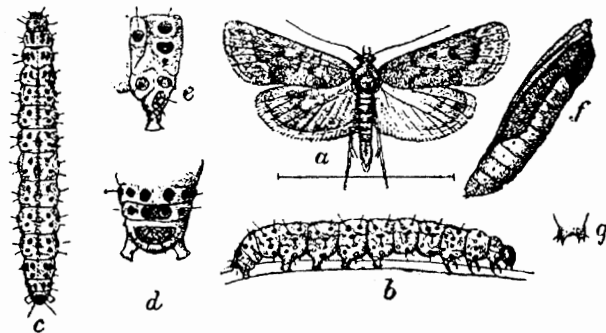


Figure 4—Moth, Larvae and Pupa

The Garden Web Worm. *a*, male moth; *b*, larva, lateral view; *c*, dorsal or top view of larva; *d*, anal segment; *e*, abdominal segment, lateral view; *f*, pupa; *g*, cremaster; *a*, *b*, *c*, *f*, somewhat enlarged. (After Riley, except *c*, which is from U. S. Bureau of Entomology)

Descriptive.—The web worm moth has an average wing expanse of about three-fourths of an inch. It is buff-colored with gradations of lighter and darker shades of gray.

The web worm is variable in color from greenish-yellow to a pale or dark yellow. In general it could be described as green with black spots at the base of stiff hairs which are also black. The black spots are bordered by a paler color than the general body color. In the older specimens there is a double longitudinal line along the dorsum and a lateral one on each side, all of which are a little lighter in shade of color than the general color. When full grown they are about one inch long.

The pupa is brown and armed at the caudal end with two short stub-like projections, each of which is furnished with three strong,

short spines by which the insect remains attached to its web on the food plant in the summer while transforming from the caterpillar to the adult stage.

The eggs are deposited on the ventral or under sides of the leaves and also on the stalks of the food plants. Generally several eggs—five to forty-two—are deposited one tier deep in masses in such a way as to cause each one to adhere to the leaf, and furthermore the entire mass is protected by a covering which at first is viscous, and later tough, the same being similar to the protective cover of tent caterpillar eggs. At first appearance after being deposited the mass is a more or less transparent, gelatinous covering, ranging from the size of a small pinhead to the size of a pea in circumference.

The Food Plants of the Web Worm

The natural food plants of this insect are the "careless" or pig weeds. In fact, one of the common names of this insect is "careless worm", derived from its food, the "careless" weed. It feeds on practically all of our common weeds, except the jimson weed and devil's claw.

The adult moths which develop on the weeds lay their eggs on practically all farm and garden crops except the wild hay and small grains, such as wheat and oats, to which they do but little if any damage. The latter have never been seriously damaged by them.

Methods of Control

1. **By Mowing Infested Fields.**—Alfalfa fields should be frequently closely inspected during the growing season, and if an infestation of web worms appears to be sufficiently great to seriously damage the crop, it should be mowed and made into hay as soon as possible. These worms can neither develop on nor injure wilted or dry hay.

2. **By Poisoning Fields.**—Alfalfa that is being grown for a seed crop can be sprayed with paris green. About one and one-half pounds per acre is sufficient. This should be diluted with mlime. At least five pounds of air-slaked lime per acre should be used. Lime, however, is a valuable fertilizer for alfalfa, and any reasonable amount can be used with good results. Dusting machines are manufactured especially for applying the dust forms of arsenicals.

Any crop, such as cotton or young corn, that is infested, can be treated the same as alfalfa, except that powdered lead arsenate may be substituted for paris green. Lime is not as necessary as a diluent with arsenate of lead as with paris green.

3. **By Renovation.**—All alfalfa fields should be renovated causing them to be pervious in order to receive and retain moisture. Fields thus treated before cold weather each year will be contracted and expanded later by freezing and thawing to such an extent as to practically destroy all the insects passing the winter in them. Most field insects must have a dry place in which to pass through the winter. If denied this privilege, their activity is greatly reduced.

4. **By Clean Culture.**—These worms develop largely on weeds. The weeds not only overtax the soil and thus penalize the growing crops by robbing them of fertility and moisture, but they also aid in developing an army of insects that disseminate into the more succulent crops. In waste places and fields where it is impossible to grow cultivated crops, and the weeds have possession, it is well to plant either sweet clover, bermuda or some similar crops that are of use in overcoming the weeds and also otherwise serviceable.

5. **By Jarring Cultivated Plants Such as Corn and Cotton.**—During the early days in Kansas, farmers attached boards similar to cracker-box lids, by means of hinges, on forward cross-piece of cultivator. This, raised by one hill of corn, would cause it to fall against the next one during the process of cultivation and the worms, being jarred off thereby in front of the cultivator shovels would be partially or completely buried in the process of cultivation. This device is also known to be good for dislodging boll worms, which are less easily disturbed than the web worm.

Synonymy.—The following are the various technical terms which have from time to time been applied to this insect:

<i>Eurycreon rantalis</i> Guen.	<i>Nymphula rantalis</i> , Guen.
<i>Eurycreon communis</i> Grote.	<i>Nephoteryx nitractella</i> , Walker.
<i>Eurycreon occidentalis</i> , Pack.	<i>Phlyctaenodes, similalis</i> , Guen.
<i>Ebula murcialis</i> , Walker.	<i>Scopula nestusalis</i> , Walker.
<i>Botys licealis</i> , Walker.	<i>Scopula crinisalis</i> , Walker.
<i>Botys sirinsalis</i> , Walker.	<i>Scopula thoonales</i> , Walker.
<i>Botys posticata</i> , Grote & Robinson.	<i>Scopula doitinealis</i> , Walker.

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