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Fig. 1. Cutworms of two species.

AGRICULTURAL EXPERIMENT STATION
IOWA STATE COLLEGE OF AGRICULTURE
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ENTOMOLOGY SECTION

Ames, Iowa
The Control of Armyworms and Cutworms

BY CARL J. DRAKE AND H. M. HARRIS.

The armyworm and several species of cutworms are always present in the gardens and fields of Iowa. Cutworms cause great annoyance here and there in the spring by cutting off transplanted and other young plants in vegetable and flower gardens. Young corn plants also are particularly susceptible to their attack. The armyworm is most frequently found in low-lying grassland and generally feeds singly, as do cutworms. The injury by armyworms and cutworms in fields or pastures of timothy, bluegrass and of certain cereal crops, is not so noticeable and is usually entirely overlooked by the grower.

In some seasons the armyworms and certain species of cutworms become over-abundant in their preferred breeding grounds. Then, upon the depletion of their food supply they suddenly, as if by common consent, migrate in army-like hordes in search of food. The rate of migration depends largely upon the abundance of the food supply. Likewise, certain factors determine the general direction of the march, which, once begun, is held to with little variation of direction thereafter. When the caterpillars are extremely numerous, hunger overcomes their aversion to light and keeps them active during the day as well as at night.

In 1924 armyworm outbreaks occurred in 35 counties of Iowa and cutworms were unusually abundant in 76 counties of the state. According to the county agents, more than 12,000 acres of corn had to be wholly replanted that year and a part of this acreage was then destroyed a second time by cutworms. In addition, over 100,000 acres of corn, oats, barley and pasture were more or less seriously injured. No armyworm outbreaks have occurred since 1924, but cutworm injury has become more intense and widespread over the state during 1925 and 1926.

DESCRIPTION AND LIFE CYCLE OF ARMYWORM

The armyworm* (fig. 2) occurs throughout the United States east of the Rocky Mountains. It normally lives in areas of certain rank growing grasses, especially in lowlands, but it is also known to breed in early sown rye fields. In occasional years the armyworm becomes abnormally abundant, migrates from grasses and rye to adjoining fields and destroys the leaves of corn, wheat, oats, rye, timothy, bluegrass and practically all other plants in its path. The mature larva is about an inch and a half long, plump, dark gray to greenish black in color, with five longitudinal yellowish stripes, three on its back and one on each side. Field records indicate that there are three generations a year in Iowa. The winter is spent in the partly grown larval stage in the soil. With the coming of spring the overwintered larvae resume feeding for a short period, pupate in the soil and then a little later issue as moths. In a few days another generation of larvae is at work and it is usually this generation which sometimes migrates in enormous numbers and causes outbreaks. A third brood of moths emerges.

* Cirphis unipuncta Haworth.
in late August and September and lays the eggs from which the overwintering larvae develop. Frequently as many as 700 eggs are deposited by a single female.

The adult of the armyworm is a grayish brown moth with a small white spot near the center of each forewing. The moths hide by day and fly only at night, when they are frequently attracted to lights. Fortunately, predacious and parasitic insects generally hold the armyworm in check to such an extent that it seldom or never occurs in devastating numbers in the same locality for two years in succession. Birds and poultry are also important armyworm destroyers, especially during outbreaks.

DESCRIPTION, HABITS AND LIFE CYCLE OF CUTWORMS

Cutworms (fig. 1) are rather plump, sleek, almost hairless, striped, spotted or nearly solid colored caterpillars. They are active at night, but often come out on cloudy days to feed. Based on their habits, they may be divided into two groups, surface feeding forms and climbing forms. Surface feeding cutworms live on or just under the surface of the soil and cut or gnaw off young shoots of plants near the ground level. The climbing forms ascend plants to feed upon the foliage and fruit.

The moths or adults of cutworms are heavy bodied, mostly brownish or dull colored moths. They fly about lights at night in warm weather and are commonly called "millers". The eggs are deposited largely in grasslands and weedy fields. In about a week or 10 days after deposition the eggs hatch and the young larvae immediately begin to feed. Pupation takes place under rubbish or in the ground.

There are many different species of cutworms, the habits and life histories of which vary much in details. Most of them lie dormant during the winter as partly grown larvae curled up in the soil or under debris. In the spring the caterpillars resume their activity and begin to feed as soon as young plants make their appearance.
HOW TO CONTROL CUTWORMS AND ARMYWORMS

In small gardens and greenhouses cutworms may be controlled by hand picking. Whenever injury is noticed the soil near the plant should be carefully searched and the caterpillar destroyed. Tomato and cabbage plants may be protected by placing cardboard or tin cylinders around the plants. Tin cans with the tops and bottoms removed

Fig. 3. Armyworms feeding on rye.
are suitable for this purpose. Frequently much of the damage may be prevented by deep plowing of grassland in the fall, followed by cultivation in the spring. This keeps down the food supply and thus destroys the larvae by exposure and starvation.

Control methods should be put into operation as soon as armyworms and cutworms are discovered. Infested areas should be treated with poison bait. Efforts should be made to keep the caterpillars out of uninfested fields. Barriers such as are constructed for chinch bug control are frequently used, but they require constant attention and repairs to be effective. If the caterpillars are marching, poison bait should be sown broadcast in their path.

Fig. 4. Demonstrating control methods for armyworms, Dows, Iowa, 1924.

Fig. 5. Eggs of variegated cutworm.
Poison Bait for Armyworms and Cutworms

FORMULA NO. 1

Wheat bran .......................................................... 20 to 25 lbs.
Paris green (or sodium fluoride) ...................... 1 lb.
Cheap molasses .................................................. 2 qts.
Water ................................................................. 2 gals.

Thoroughly mix the dry poison and bran with a hoe in a tub or large box. Pour the molasses (black strap or any low grade molasses) into the water and mix. Then moisten the poisoned bran (keep mixing with hoe) with the sweetened water, using additional water if necessary, until a moist and crumbly but not sloppy mixture is obtained. If the mixture holds loosely together when pressed in the hand it is properly prepared.

FORMULA NO. 2

Wheat bran .......................................................... 20 to 25 lbs.
Sodium arsenite (weed killer) ................................. ¼ pt.
Low grade molasses .................................................. 2 qts.
Water ................................................................. 2 gals.

Fig. 6. Variegated cutworm (Peridroma margaritosa Haworth).
Pour the poison into the water. Dissolve the molasses in the poisoned water and then moisten the bran with this solution as directed in formula 1.

The poison should be broadcast by hand as thinly as possible over the gardens or fields where cutworms or armyworms occur. The mixture is not attractive after becoming dry, so it should be applied in the late afternoon or evening in order to be fresh when the caterpillars begin feeding soon after sundown.

A mash made according to one of the foregoing formulae should cover three or four acres at a cost of about 40 cents per acre for materials. There is no danger of poisoning livestock if the mixture is scattered very thinly and evenly so as not to leave any little balls or lumps on the ground. The poison bran mash should be prepared so that it falls in flakes when scattered. It takes only a small amount of poisoned bran to kill a large number of caterpillars. In large areas the poison bait may be applied very rapidly by the use of an endgate seeder. This method requires more of the bait mixture because it cannot be scattered so evenly and thinly as by hand. Because of the danger of poisoning, it is advisable to keep livestock out of fields which have been treated with an endgate seeder for several days.