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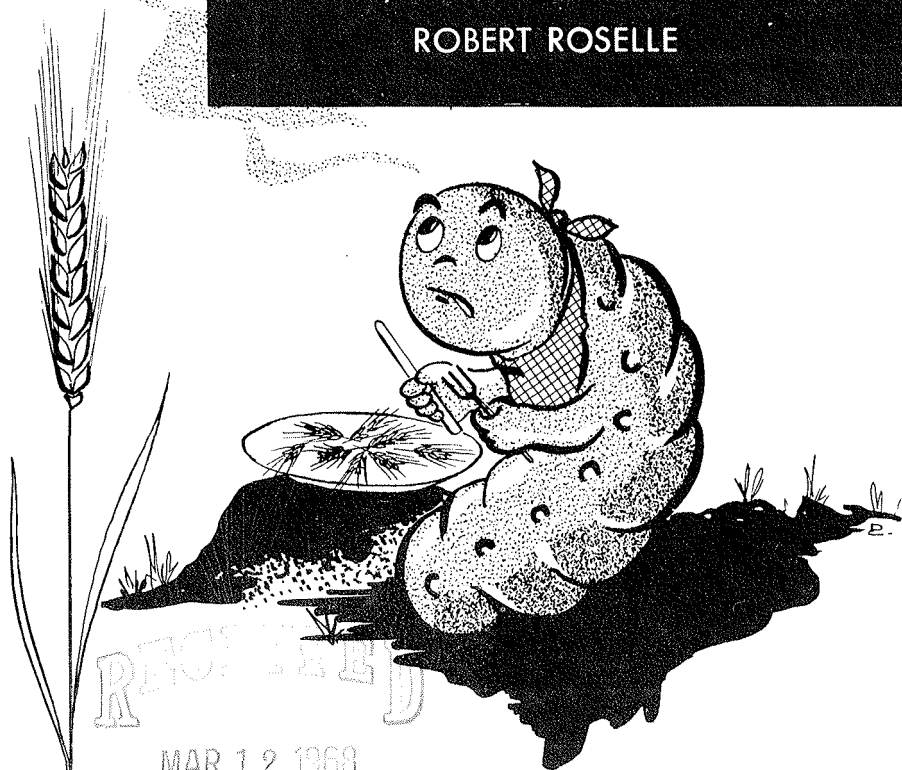
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(REVISED)

PALE WESTERN CUTWORM CONTROL

by KENNETH P. PRUESS

ROBERT ROSELLE

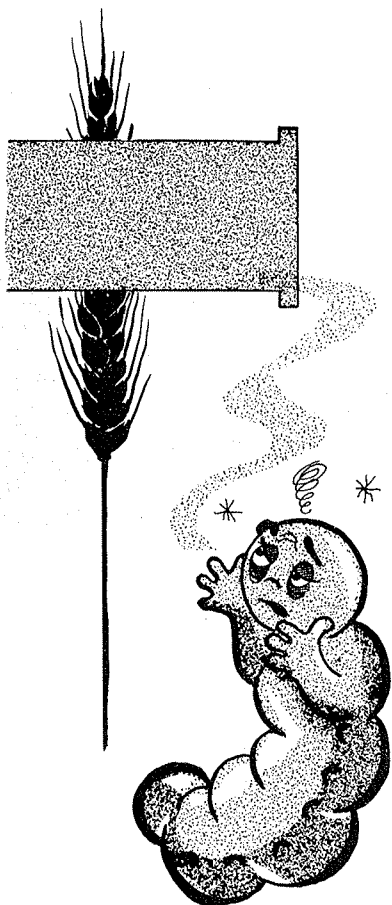


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pale western cutworm control

by KENNETH P. PRUESS
ROBERT ROSELLE

The pale western cutworm was first recognized as a serious pest in Nebraska in 1953 when heavy infestations occurred in Kimball and Banner counties and much of the wheat crop was lost. In the following years, the insect spread eastward and has been found as far east as Gordon, North Platte, and McCook.

Description, Life History

Eggs, (Fig. 1) which are deposited in the fall, hatch on warm days in February into tiny worms about 1/8 inch long. The larvae, (Fig. 2) or worms, grow by shedding their old skins and forming new flexible ones.

The pale western cutworm usually has eight such stages before becoming full grown. Each stage eats almost twice as much as the preceding stage. Larvae become full grown in late May or June. They then burrow into the soil one to eight inches, form earthen cells, (Fig. 3) shrivel up and become inactive until August.

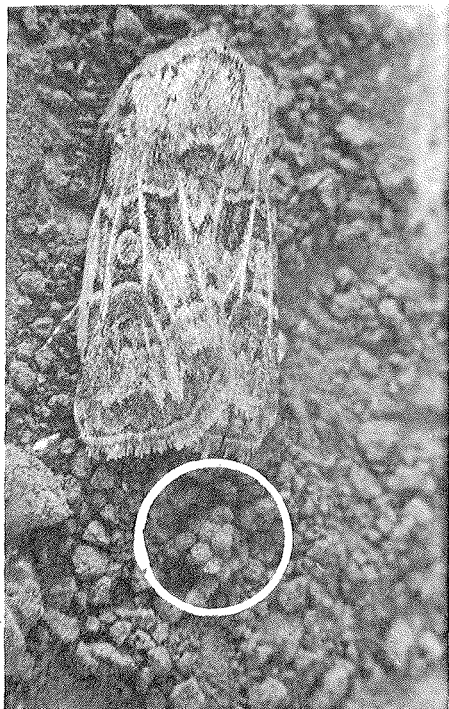


Fig. 1. Adult moth, eggs (circled). Eggs covered with soil particles.

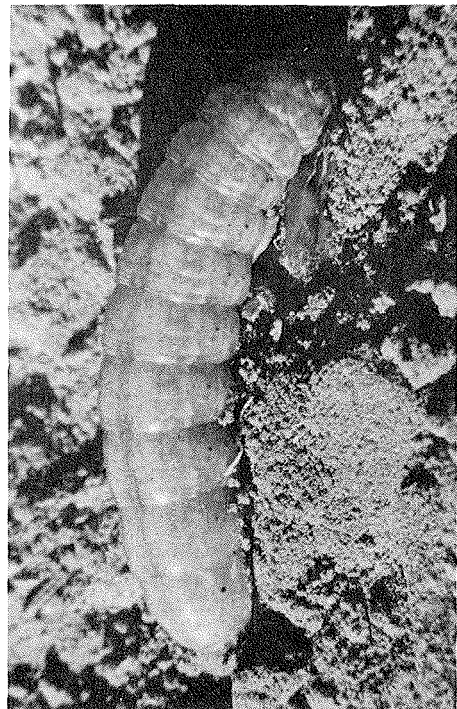


Fig. 2. Developed cutworm larva may be one and a half inches in length.

The adult moths are often called "millers". They are brownish-gray and have conspicuous mottled markings on the front wings. They are about $3/4$ of an inch long. Adults feed on the nectar of goldenrod and other flowers during the night and may be attracted to lights on warm nights.

Eggs are laid in loose soil. Loose soil resulting from the planting operation makes newly seeded wheat fields especially attractive for egg laying. However, eggs are sometimes laid in old stubble fields. Each moth will lay about 300 eggs, usually in small clumps of 5 to 10 eggs.

Eggs are deposited $1/4$ to $1/2$ inch deep and are covered with fine soil particles, making them almost impossible to find. Although eggs are ready to hatch after 3 to 4 weeks,

they apparently do not do so until the following spring. However, unusually warm, wet weather in the late fall or winter may cause some eggs to hatch.

The larva, or worm stage, is about $1\ 1/2$ inches long when full grown. It is whitish to gray-green in color and has no conspicuous coloration except a dark, inverted V-shaped mark on the head. This marking, and the absence of dark stripes on the body, distinguishes the pale western from most other common cutworms.

Damage, Description

The pale western cutworm is primarily a pest of winter wheat or barley; however, it will feed on almost all cultivated plants planted in infested fields. In Nebraska, damage has occurred to safflower,

corn, and sorghum. If a wheat field has been destroyed, it is not safe to plant the field immediately to another crop without insecticide treatment.

The first indication that cutworms are present usually is the appearance of small holes in the wheat leaves. (Fig. 6) This may occur in late February and March while the cutworms are small and very difficult to find. All stages of the cutworm larvae feed underground, the indications of early damage appearing after plant growth pushes the leaf above ground.

As the larvae become larger, they move along the drill row, cutting off entire plants. (Fig. 7) Cutworm damage resembles drought injury since most of the above ground foliage is not eaten, but simply dries up after the underground stems have been cut. If the injury

has been caused by cutworms the individual stems are easily pulled out, whereas, in the case of drought injury the whole plant will come out. The depth at which plants are severed depends to a large extent on the soil moisture level. The larvae usually feed just above the moist layer. During wet weather they are sometimes forced above ground. Most serious damage generally occurs from April to June.

First indications of damage will likely occur in fields which were loose in soil texture during the egg laying period the previous fall, and on higher elevations of fields.

When eggs are laid in stubble fields, the larvae feed on volunteer wheat and weeds. If crops are planted in such fields later in the spring, severe injury may occur. Larvae can undergo starvation for as long as a month without adverse effects.

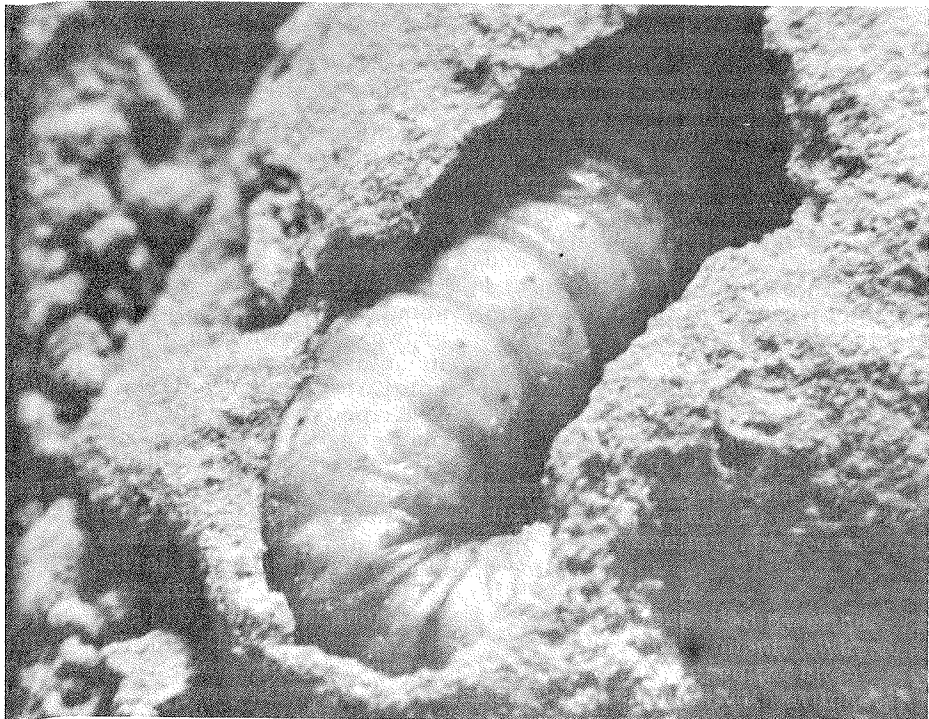


Fig. 3. Cutworm preparing earthen cell in which it will change to pupa.

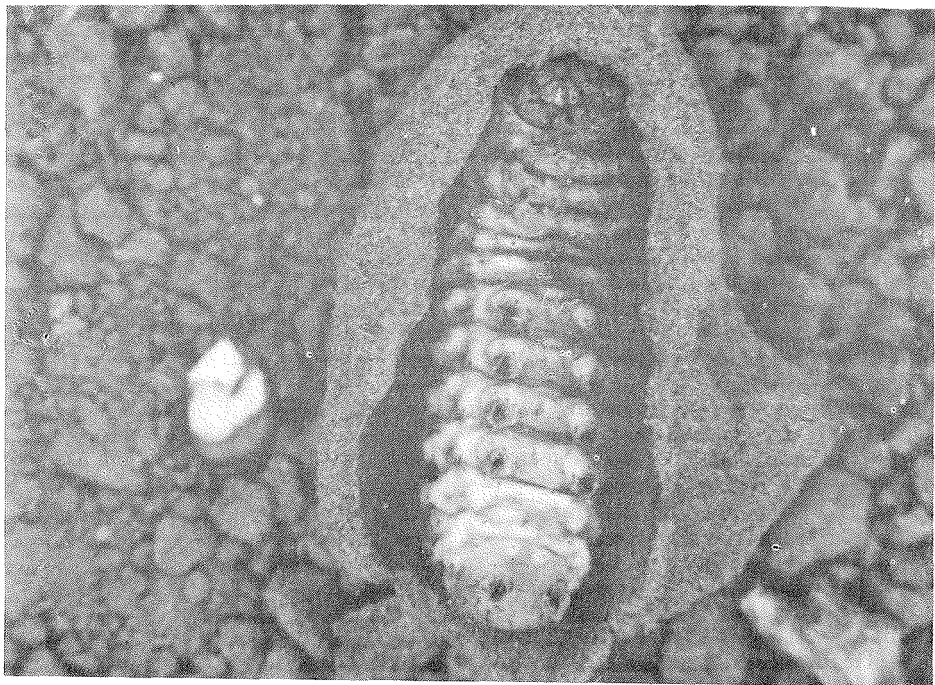


Fig. 4. The pre-pupa stage of the pale western cutworm in earthen cell.

In cases in which larvae have been starved, development is delayed and damage may occur in June and July.

Natural Control

Birds, toads, ground beetles, and other insects feed on the cutworm larvae. Also, several kinds of flies and wasps parasitize the larvae. However, these predators and parasites appear to be of little value in Nebraska and cannot be depended on to give satisfactory control.

During wet seasons, several bacterial and fungus diseases attack the larvae and may give almost complete control. These diseases are responsible for the cutworm being scarce after a wet season. During dry years, these diseases are of little importance, and two or three consecutive dry years permit populations to build up to outbreak proportions.

Cultivation and burning are of almost no value in killing the larvae. Burning will remove organic material which is highly beneficial to soil structure and fertility. Irrigation, though rarely practical, should help control pale western cutworms by creating conditions favorable for development of diseases.

Chemical Control

Several insecticides will control pale western cutworms; the most effective being endrin. The second choice of insecticides is dieldrin. Heptachlor, aldrin, DDT, and toxaphene have not been entirely satisfactory and are not recommended.

Sprays may be applied by either ground or air equipment. When ground equipment is used, the chemical should be applied with at least five gallons of water per acre. For aerial application, the insecticide

Insecticide	Amount Per Acre
Endrin	3 ounces (1 pint of 1/6 lbs. per gallon endrin emulsifiable concentrate).

should be mixed with one gallon of diesel fuel per acre. More than one gallon of diesel fuel may injure the wheat. If water is used for aerial application, use two to five gallons per acre. Air or ground sprays should always be applied when wind is calm (less than five miles per hour) for most effective results. Do not graze fields which have been sprayed with endrin or dieldrin.

It is not necessary to work the insecticide into the soil; however, if the moisture level is low, results probably will be less effective if the insecticide is not worked in. If the soil is dry, a rotary hoe or spike tooth harrow may be used without serious injury to the wheat.

Dusts and granules are not recommended for control of pale western cutworms. Spraying adults or other preventive treatments in most cases probably will not be economical.

The best time to apply insecticides will depend upon the severity of the infestation, and the moisture conditions. Usually controls are suggested when damage first oc-

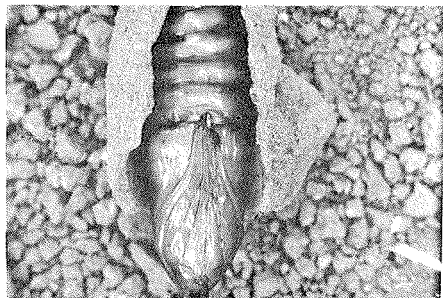


Fig. 5. Pupa stage in earthen cell.



Fig. 6. Injury done to wheat plant.

curs, and there are one or two cutworms per foot of drill row. If moisture is adequate, wheat often will overcome early damage if cutworms are controlled.

CAUTION: Endrin and dieldrin are hazardous insecticides and must be handled with extreme care. Always avoid breathing mists, exposure to skin, or contamination of food or feed. Respirators and protective clothing are desirable, especially if sprays are applied with ground equipment. If poisoning is suspected, call or see a physician immediately, taking the insecticide container with you. **ALWAYS** read the cautions on the label before opening a container of ANY insecticide.

pale western
cutworm

CONTROL

