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# Western Bean Cutworm

*... and*

# Its Control

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# Western Bean Cutworm and Its Control

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The western bean cutworm (*Loxagrotis albicosta* (Sm.)) has different feeding habits from those of the common garden cutworms that cut off the plants near the soil surface in the spring of the year. It belongs to the group of cutworms that climb the host plants to feed upon foliage, stems, buds, seed, or fruit. In southern Idaho it is an important pest of beans. Before changing its habits to attack beans, the western bean cutworm fed upon the fruits of ground-cherry and nightshade.

This cutworm has four stages of development—egg, larva or worm, pupa, and adult or moth. The adult, or moth, has a body about  $\frac{3}{4}$  inch long and a wing spread of  $1\frac{1}{2}$  inches (*fig. 1*). The forewings are a rich brown color with a lighter colored, narrow margin along the outer or front edge. Behind this band are alternate light and dark markings, giving a spotted effect along the length of the wing.

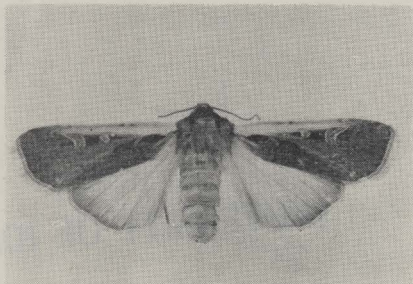


Figure 1.—The adult, or moth, of the western bean cutworm.

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The hindwings are light tan, shading to a darker rich brown along the outer margin.

The moths emerge, generally, during the latter part of July and the first part of August. A few days after emerging from the soil the female moths begin to lay eggs at night, usually on the under side of the bean leaves. The moths prefer heavy foliage for egg-laying, and, consequently, the injury is generally the greatest in fields where rank growth occurs. The eggs are laid in masses of from 5 to 225, as shown in figure 2. The eggs are dome-shaped, smaller than the head of a common pin, coarsely ribbed and reticulated, pearly white when first laid but becoming a bluish-black just before hatching.

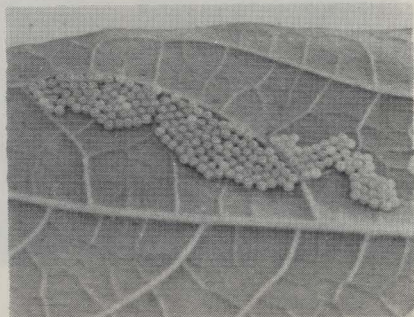


Figure 2.—Egg mass of the western bean cutworm on bean leaf.

The eggs hatch in about a week, and the young eat the eggshells before feeding on the leaves (*fig. 3*), buds, and flowers. These worms, being very small when hatched, are dark in appearance and consume very little food during the first



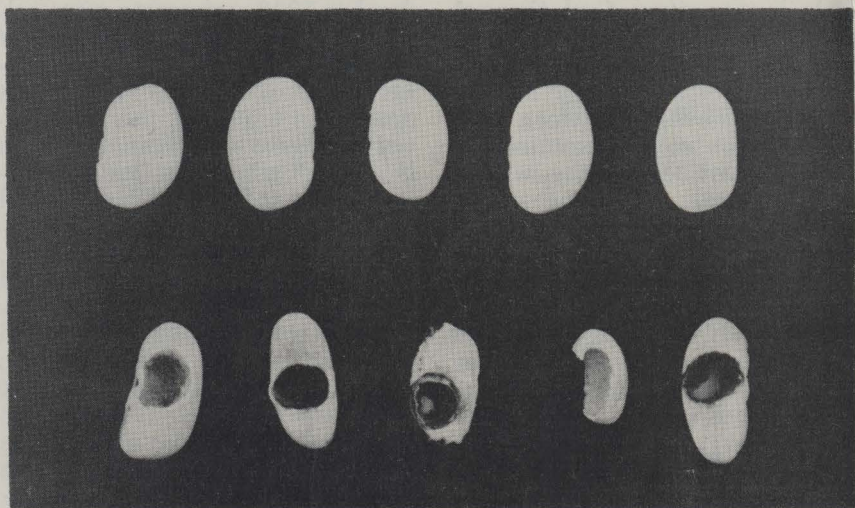


Figure 4.—Comparison of damaged and undamaged beans.

rowed, preparatory to threshing, the cutworms congregate under the windrows and continue to feed upon the green and immature seed until threshing is completed. If rains occur after the beans are cut and windrowed, the injury is greater than during dry seasons, since the plants are exposed for a longer period of time. This cutworm will

starve when placed with dry beans, as it is unable to feed upon the seed after it matures and dries (*fig. 5*).

The worm holes in the beans reduce the yield, lower the grade, increase processing costs, and restrict the sale of beans for culinary purposes. It is mandatory that both snap beans for seed and commercial dry beans harvested from fields that sustained cutworm injury be handpicked to remove the damaged beans.

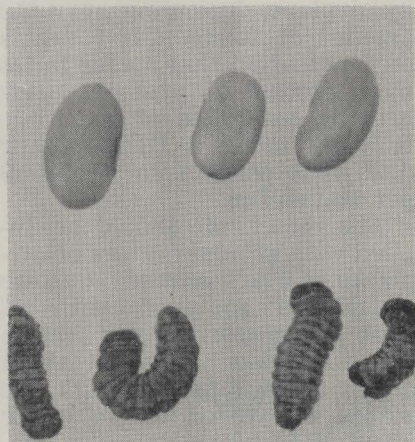


Figure 5.—Western bean cutworm larvae which have been placed in containers of mature dry beans and died for lack of food.

## Detection

Since the female moth lays her eggs where the foliage is heaviest and on the under side of the bean leaf it is difficult to find the egg masses. The small worms are also hard to find, since they have the habit of hiding during the day in buds, flowers, and leaves, and the buds and flowers often have to be opened to locate them. They often eat portions of the lower epidermis of the leaves on which they hatched, and by making a close examination, the small worms may be found. After the worms are a

few days. They appear about the time the pods begin to set and feed until the plants are threshed. When they have grown to about  $\frac{1}{2}$  inch in length, they start feeding on the pods and the developing seed. They generally feed at night or on cloudy days. When not feeding, they may burrow into the soil around the plants or a few may stay on bean foliage throughout the day. They reach full growth about the time beans are being harvested, and at this time they are fully  $1\frac{1}{2}$  inches long and  $\frac{1}{4}$  inch in diameter and have a pinkish brown color.

As cool weather approaches, the mature worms enter the soil to a depth of from 3 to 9 inches and construct earthen cells in which they pass the winter. When the soil warms up late in the spring or early summer, they change to pupae. The moths, more commonly known as millers, emerge in July or early

August. Evidently, moist soil, resulting from heavy rains or irrigation, is necessary for the moths to emerge from the pupal cells deep in the ground.

## How They Damage Beans

Bean growers in Magic Valley and the Blackfoot area are familiar with the holes in the bean pods and the "chewed" seed. All the injury is done by the larvae, or worms, which eat through the pods into the developing and maturing seed, since the adults, or moths, do no harm to the bean plants. The worms usually eat only a portion of each seed (*fig. 4*). Injured beans are light in weight, and since the germ has often been injured or destroyed, they are worthless as seed. This insect injures the beans throughout the period of pod development. After the bean plants have been cut and wind-

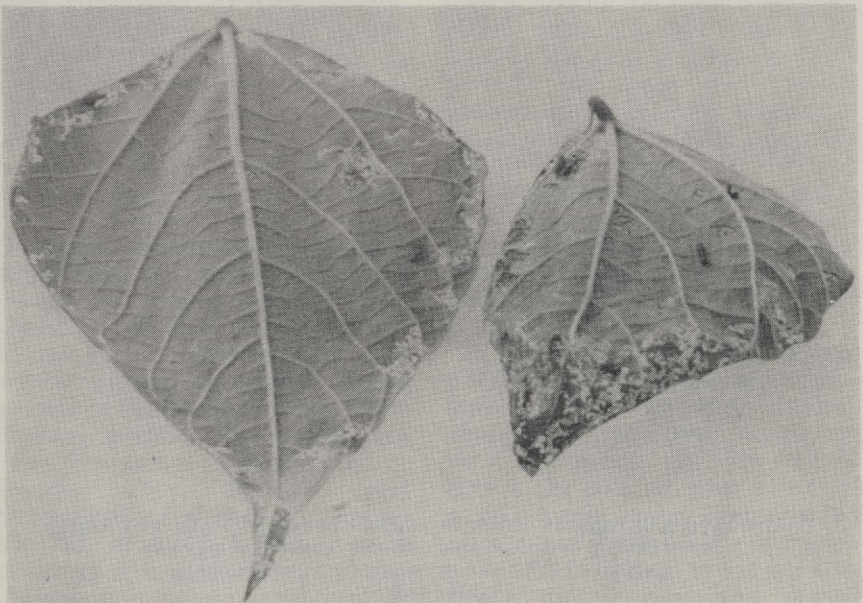


Figure 3.—Bean leaves showing feeding damage by young bean cutworm larvae.



little larger, they feed through the leaf, and the injury resembles shot holes. These holes may be readily observed by anyone walking slowly between the rows. Upon closer examination of the plant leaves the worms will be found. After the worms begin to feed upon the pods, they may be found by giving the plants a quick slap and knocking the worms into the middle of the row. If they have entered the soil under the plants, they may be found by raking the soil to a depth of 1 inch.

## History

The western bean cutworm is probably a native of North America and was described in 1887 from moths collected in Arizona. This insect is well distributed in the bean-growing areas of Colorado. In 1915, a seed dealer in Weld County, Colorado, reported that he refused Pinto beans from a small area southwest of Greeley because of injury. In 1925, injury occurred at Trinidad and at Fruita, Colorado. In 1941, Sam McCampbell, Extension Entomologist of Colorado, reported losses of 50 per cent in some fields in Mesa County. In 1948, John L. Hoerner, Entomologist, Colorado Agricultural Experiment Station, reported that the injury to beans varied from slight to 80 per cent. Typical injury was observed by the senior author in stored beans grown in Estancia Valley, New Mexico, in 1954. The moths have also been taken at light traps at Garden City, Kansas, and Scottsbluff, Nebraska. During the fall of 1945, a few worms obtained from the gravity machines in a bean warehouse at Kimberly, Idaho, were identified as cutworms. During Sep-

tember 1946, cutworms were collected from beneath windrows of beans in the Blackfoot and Rupert areas of Idaho. These were reared to moths at the Entomology Research Branch Field Station, Twin Falls, Idaho, during the winter of 1946-47 and were determined to be the western bean cutworm. At that time, bean inspectors, seedsmen, and commercial bean dealers reported that this type of injury had been noticed for about 4 years in beans grown in the Blackfoot and Rupert areas. The known distribution in Idaho at the close of 1954 is from Blackfoot to Glens Ferry.

## Chemical Control

Shortly after the pods begin to set, observations should be made where the bean foliage is the heaviest to see if the young worms are there. This should be repeated every 2 days, and if any young worms are found, the plants should be dusted immediately with a 5 per cent DDT dust at the rate of from 20 to 25 pounds per acre for ground dusters and from 25 to 30 pounds by airplane, depending upon the amount of foliage. If there is any indication that spider mites may become a problem, they may be controlled at the same time by using a DDT-sulphur dust that contains at least 40 per cent sulfur.

The insecticide should be applied with ground dusters or airplanes. The ground dusters should be equipped with at least one nozzle per row, set to direct the flow of dust at about a 45° angle down through the plants, and with a canvas trailer about 20 feet long to insure adequate distribution and coverage. The machine should also be equipped with vine lifters and

spreaders to prevent the wheels from injuring the plants. Dust should be applied when there is little or no wind, preferably early in the morning or evening.

When dusting by airplane, the dust should be applied from a height of 4 feet and when the wind does not exceed 4 miles per hour. The swaths should be no wider than the wing span of the plane, and a flagman should mark the swaths.

**Remember**—young worms are easier to control than large ones. They move around over the plants and come in contact with the dust more readily than the older worms. If the insects are not controlled before they start feeding, “chewed” beans can be expected at harvest time. There-

fore, timing is just as important in insect chemical control as the material and method used.

### **Precautions**

Bean pods that have been treated with DDT should not be eaten because of the residue hazard.

Vines that have been treated with DDT should not be fed to milk animals or to meat animals being finished for slaughter.

DDT is a poison. Handle it with care. Store it in closed containers where it cannot be mistaken for food or medicine and where children or farm animals cannot reach it. See that the containers are properly labeled.

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D. R. THEOPHILUS, *Director*

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