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A New Insect Pest of Corn in Idaho

The Western Corn Rootworm

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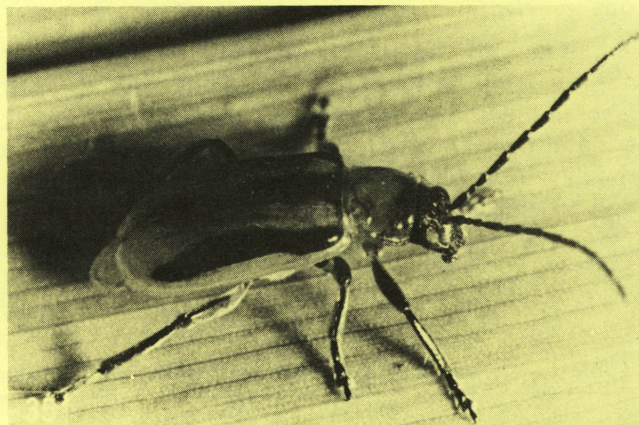
The western corn rootworm is a beetle that is native to the Great Plains and has recently migrated to Idaho. This insect, along with two other closely related species, causes heavy losses annually to corn growers in the corn belt.

The western corn rootworm was reported in the Cache Valley of Utah in 1970. Within a few years, it spread into Franklin and Oneida counties in south-eastern Idaho. In summer 1979, it was found south of Nampa in Canyon County and in September an infestation was discovered near Aberdeen in Bingham County.

When the last two infestations were found, the insect was apparently well established, judging by the numbers of individuals present. The field south of Nampa was sprayed with an insecticide shortly after the original observations were made. This field and other fields in the locality were surveyed several times after the insecticide application and no more adults were found.

Description

The adult beetle is about ¼-inch long, slender, yellowish green with three dark stripes or a dark area formed by merger of these three stripes on the back. It is very active and flies readily when disturbed. Airplane pilots have observed this insect in large numbers high above ground. It also may fly relatively long distances in a single flight. This beetle can be confused with the elm leaf beetle, which may be found on corn close to elm trees, except that the elm leaf beetle is much darker, tan to brown.



The females lay small, pale yellow, faintly sculptured eggs in the soil, mostly within 6 inches of the surface and usually in corn fields. These eggs will not hatch until the following spring.

The larvae are slender, threadlike, white to pale yellow worms. When mature, they are about ½-inch long, with brown heads. When full grown, they change into fragile, white pupae about ⅛-inch long.

Life Cycle and Habits

The eggs are laid in soil, usually around corn plants, from late July until frost. A few eggs may also be deposited in fields or waste areas where adults have dispersed to feed on pollen of other plants.

When soil temperatures warm to 52° F in the spring, the eggs begin to develop. The eggs will probably hatch about the middle of June to early July in southwest Idaho and the young larvae will

move through the soil in search of corn roots on which to feed. A few may develop on roots of other cereals or grasses. Since all eggs are not subjected to the same soil temperatures, hatching occurs over an extended period of time.

The larvae feed on root hairs and tunnel into corn roots for about a month before they are full grown. This feeding may stunt the plants and reduce yields. Damaged plants may lodge, increasing harvesting costs. The root damage may also allow entry of stalk rot organisms, further weakening the plant.

When mature, the larvae leave the roots, tunnel through the soil a short distance and form cells for pupation.

The first adults should emerge about the middle of July in southwestern Idaho. They feed on tender portions of the plant, especially pollen and silks. If 2 or more adults per ear are present, pollination and resultant yields may be seriously reduced. After mating, a few days are required for the eggs to mature and oviposition to begin. This insect has only one generation per year.

Damage by this insect is twofold: (1) larvae feed on the roots, which reduces yields directly and also indirectly, by predisposing the roots to stalk rot and the plants to lodging; and (2) adults feed on the developing silks, which may prevent pollination and severely reduce yields.

Control

The best control for corn rootworm is to rotate corn with another crop. If a grower plants corn after corn he may expect injury, especially if he has had damage in the past.

The tassels and silks of plants should be checked for adults of the rootworm when the plants are silking. As a general rule, one adult rootworm per plant means a rootworm problem may develop in corn planted in that same field next year. If 2 or more adults per ear are present and the seed has not set, a spray for control of adults may be needed. At least ½-inch of silk must protrude beyond the tip of the ear for the silk to be receptive to pollen grains.

Plants that show wilting, stunting or lodging in June should be examined for rootworm larvae or their damage to roots. If larvae or damage are found early a chemical application as in step 3 below may be made to protect the field from further injury.

Chemical Control

Four types of chemical application for western corn rootworm may be made:

For Larvae

1. **Broadcast applications** — Immediately before planting, spray or apply granular insecticides to

Table 1. Chemical methods for controlling western corn rootworm.

Insect type	Type application	Insecticide	Rate (active ingredient per acre)	Days before harvest
Corn rootworm adults <i>See Pollinator Poisoning Note</i>	Foliar application ¹	malathion	1 lb	5
		ULV malathion	¼ lb	5
		diazinon	½ lb	0
		Sevin	1 lb	0
		methyl parathion	¼ lb	12
		parathion	½ lb	12
		Di-Syston	1 lb	28
Corn rootworm larvae	Soil band at planting	Furadan	¾ lb	—
		Lorsban	1 lb	—
		Counter	1 lb	—
	Soil band at planting or post-emergence in June	Dasanit	1 lb	40
		Di-Syston	¾ lb	28
		Thimet	1 lb	—
		Dyfonate	1 lb	45
		Mocap	1 lb	—
	Soil band post-emergence in June	diazinon	1 lb	—

¹Pollinator poisoning. All of the recommended foliar insecticides will kill bees for 24 hours after application. When needed, apply in the evening after bees have stopped foraging. Do not apply Sevin when pollen is available for bee foraging in the field.

the soil surface and immediately disc to prevent breakdown of the insecticide.

2. **Band applications at planting** — Spray or apply granular insecticides in a 6- to 8-inch band over the row. Place the granular spreader spout or spray nozzle between the seed spout and covering wheel so that the insecticide is in the area of the seed but not in contact with the seed which could reduce germination. Generally this will cover the insecticide with soil; if it does not, the covering wheel should be modified. The insecticide can also be applied in bands and incorporated after planting and before corn emergence.
3. **Cultivation band applications** — Spray or apply granular insecticides in bands 3 to 4 inches on each side of the row of growing corn and incorporate into the soil with the cultivator shoe. This application is only recommended if the root-worm infestation is found after corn emergence.

For Adults

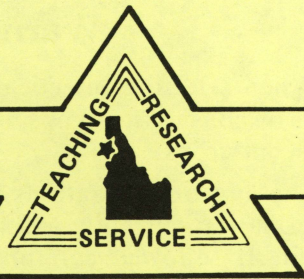
4. **Foliar application** — May be necessary if 2 or more adults per ear are present and the seed is not set. See Table 1 for materials and rates.

Warning

When selecting insecticides **prevent illegal residues** by considering crops in rotation and drift onto adjacent crops.

These recommendations for use are based on the information currently available for each chemical listed. If followed carefully, residues should not exceed the tolerance established for any particular chemical. To avoid excessive residues follow label recommendations carefully with respect to dosage levels, number of applications and minimum interval between applications and harvest. **The grower is responsible for residues on his crops as well as problems caused by drift from his property to other properties or crops.**

*To simplify information, trade names have been used. No endorsement of name products is intended, nor is criticism implied of similar products not mentioned. **Keep records of all pesticide applications.***



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