

# Controlling Corn Rootworms in Commercial Corn Crops

Corn rootworms are the larval stages of various species of cucumber beetles. Early-planted corn in western Washington and Oregon is susceptible to damage by the larvae of the western spotted cucumber beetle, *Diabrotica undecimpunctata undecimpunctata* Mann. The larvae feed on germinating seeds, seedlings, and established root systems of both sweet and field corn. Symptoms of damage include skips, spotty stands, and seedlings up to 2 feet high that lodge after irrigation.

## Description and damage

The adult is a black-spotted green beetle about 1/3 inch long, very numerous in the late spring, summer, and fall months. It feeds on the foliage of a wide variety of plants including corn, beans, orchard fruits, squashes, garden ornamentals, as well as many weeds.

The larvae are cream colored with brown heads and when full grown are approximately 1/2 inch long. The larvae are found in the soil around roots and crowns and boring up into the stalks of young corn plants. They feed in and on germinating seeds, developing crowns, roots, and rootlets, causing stunting, distortion, and death of plants. Severe damage and economic loss can occur on early-seeded corn in the coastal and valley areas of northern Oregon and southern Washington west of the Cascade Mountains.

## Life history

The beetle overwinters as an inactive adult in undisturbed areas such as field margins and uncultivated areas. Adults become active in the spring as temperatures increase and plants begin to grow. The females deposit eggs in the soil in newly seeded cornfields and around the crowns of growing corn plants. Up to 1,800 eggs may be deposited by a single female over a period of 5 months, although 600 is about average. The eggs hatch in from 10 to 30 days, depending on the soil temperature, and the larvae begin to feed.



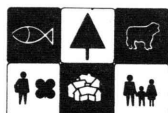
Corn rootworms in this silage corn field in Polk County have caused serious damage—skips, lodging, and stunted plants.

There are three larval stages before the pupal, non-feeding stage is reached. The developmental time of the larvae is from 10 to 40 days, depending again on the soil temperature, being most rapid at higher temperatures. Adults of the season's first generation emerge in late June in the Pacific Northwest. The cycle is repeated once more before winter arrives, resulting in two complete generations a year. Because of the long lifespan of the adult females, probably larvae from both the overwintering and first generation females occur on spring-seeded corn.

## Control

It is difficult to predict if rootworms will be enough of a problem in corn to justify the expense of controls. Related species in the North Central states cause damage with regularity. Damage in the Pacific Northwest by this species is erratic and not

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predictable. Field observations by entomologists in Washington and Oregon indicate that damage occurs more often to early-seeded corn and corn grown in heavy, wet soils. Low areas of cornfields usually have the most severe damage. Certain fields in Clark County, Washington, and Oregon counties north from Benton suffered damage from this corn rootworm species during the 1976 and 1977 seasons.

If damage occurred in the past season and early-planted corn will be seeded in or near the immediate area of injury, application of an insecticide at planting time or shortly thereafter may be justified. The following materials are registered for use on corn for control of rootworms. Note the restrictions listed with each material. Nonregistered materials may not be used on commercial sweet corn.

#### Recommended Corn Rootworm Controls

Material	Rate of formulated material	Instructions
<b>Preplanting<sup>1</sup></b>		
fensulfothion (Dasanit 15G)	6 to 8 ounces per 1,000 feet of row for any row spacing or 5 to 6.7 pounds per acre for 40-inch row spacing	Use at planting time. Place granules in 4- to 6-inch band behind planter shoe in front of press wheel. Should not be relied on for complete seed corn maggot control.
carbofuran (Furadan 4F) (field corn only)	1.5 to 2 quarts per 13,000 linear feet (1 acre with 40-inch row spacing)	Apply at planting as a 7-inch band over the row or inject on each side of the row by mixing with water or certain compatible liquid fertilizers. Do not plant vegetable root crops within 18 months of application.
carbofuran (Furadan 10G) (field corn only)	Use 7.5 to 10 pounds per 13,000 linear feet (1 acre with 40-inch row spacing)	(1) Place in 7-inch band ahead of press wheel and incorporate in top inch of soil; —or— (2) Direct granules in planter shoe with seed; —or— (3) Drop granules into furrow behind seeds. Not recommended for seed corn maggot control. Do not plant vegetable root crops within 18 months of application.
phorate (Thimet 15G)	8 ounces per 1,000 feet of row for any row spacing (minimum 30 inches) or 6.5 pounds per acre	Place granules in a 7-inch band over the row behind the planter shoe in front of the press wheel. DO NOT CONTACT THE SEED. Not recommended for seed corn maggot.
<b>Postemergence<sup>2</sup></b>		
fensulfothion (Dasanit 15G)	6 to 8 ounces per 1,000 feet of row (any row spacing) or 5 to 6.7 pounds per acre for 40-inch spacing	Distribute granules in 4- to 6-inch band along the row at the bases of the stalks. Drop granules in front of cultivation equipment for maximum incorporation. Do not use within 40 days of harvest for food or forage.
phorate (Thimet 15G)	8 ounces per 1,000 feet of row (minimum of 30-inch row spacing) or 6.5 pounds per acre	Apply granules at time of cultivation in a band at base of plants just ahead of cultivator shovels to cover granules with soil. Make no other applications after this cultivation treatment.
carbofuran (Furadan 10G)	7.5 to 10 pounds per acre	Apply in a band over the row or as a sidedress to both sides of the row at cultivation.  Do not plant vegetable root crops within 18 months of application.

<sup>1</sup> Use one of the recommended materials for preplanting.

<sup>2</sup> Use one of the recommended materials as a postemergence treatment only if treatment was not applied at preplanting. Apply at cultivation.

#### Metric Equivalents (Approximate)

1 ounce = 31.103 grams	1 gram = .035 ounce
1 pound = 453.592 grams (or .454 kilogram)	1 kilogram = 2.204 pounds
1 quart (liquid) = .946 liter	1 liter = 1.056 liquid quarts
1 inch = 2.54 centimeters (.0254 meter)	1 centimeter = .393 inch
1 foot = .304 meter	1 meter = 3.280 feet
1 acre = .404 hectare	1 hectare = 2.471 acres