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Soil Insects Attacking Corn

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The Soil Insects

CORN ROOTWORMS

CORN ROOTWORMS have caused more damage to corn in South Dakota than has any other soil pest. The three corn rootworms found in our state are the northern corn rootworm, the southern corn rootworm, and the western corn rootworm. Adult beetles can be told apart but the worm stages of all three rootworms are very similar: slender, yellowish-white worms with yellowish-brown heads and approximately one-half inch long. These worms burrow into roots and crowns of corn and may feed externally on the roots. Injury is serious in young plants as a large part of the root system may be destroyed. Wounds caused by these larvae also permit entry of root rot organisms. Corn plants may become stunted through lack of nourishment, or may become lodged and "goose-necked" as the plant matures.

The northern and western corn rootworms overwinter in the egg stage in corn fields while the southern adult beetle flies in during the spring to lay eggs around young corn plants. Rootworm eggs hatch sometime in June; the worms move through the soil until they encounter corn roots and begin to feed. Adults emerge some time in August. Corn rootworms have but one generation per year. Adult beetles of the northern corn rootworm are solid in color, yellowish-green to green, and from one-sixth to one-fourth inch long. Western corn rootworm beetles are the same size as the northern beetles and of a similar color with the exception of two black stripes down the back; these black stripes are quite variable in width. The adult beetle of the southern corn rootworm (also known as the spotted cucumber beetle) is about one-fourth inch long and yellow or green with 12 black spots on its back. Adult beetles damage corn by feeding on silks and sometimes preventing proper pollination which results in barren cobs or ears with only a few kernels.

Corn rootworms are most abundant in fields where corn is grown year after year on the same ground in the southeast and south central regions of the state. They have been known to damage first year corn when the field has been out of corn for only 1 year. For rotation to be effective, land must be taken out of corn from 2 to 3 years before being replanted. This, of course, is most effective against the northern and western species.

WIREWORMS

Wireworms are larvae or the worm stages of certain click beetles. These worms are shiny, slender, cyl-

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indrical, hard-shelled, and vary from yellow to brown in color. Worms vary in length from one-half to 1/4 inches. Wireworms injure corn by eating corn seed in the soil or by feeding on underground plant parts. There are many species of wireworms with varying life cycle lengths. Wireworms are more of a problem in newly-broken sod or in land that is heavily manured or otherwise high in organic matter.

CUTWORMS

Several species of cutworms like to feed on young corn plants. Among them are the black cutworm, the greasy cutworm, the clay-backed cutworm, the dingy cutworm, and the granulated cutworm. Most of the cutworms damage the young corn plants by cutting off the plants right at the soil line. When infestations are heavy, the entire stand can be destroyed.

SEED CORN BEETLES AND MAGGOTS

The seed corn maggot is the worm stage of a fly. The adult is not well known; the larva is the stage that feeds on developing corn seed and causes the damage. The worm stage of a small brown beetle known as the seed-corn beetle attacks the developing seed in much the same manner as does the maggot. When spring seasons are wet and cool, so that the seed develops slowly in the ground, damage from these two pests is apt to be more severe.

How to Prevent Damage

Two insecticides, aldrin and heptachlor, when properly applied will control most of our soil pests attacking corn. These insecticides may be broadcast over the entire field at 1 pound of actual chemical per acre or applied as a band or row treatment at one-half

Unseen Pests of Corn May Be Robbing You by Reducing Yields

pound of actual chemical per acre. Apply the insecticide while preparing the field for planting in the case of broadcast treatment or during the planting operation if a row treatment is planned. These insecticides are available in several different forms: granulars, emulsifiable concentrates, and liquid and dry insecticide-fertilizer mixes.

How to Apply the Insecticide

BROADCAST

An over-all field or broadcast treatment can be made with granulars, sprays, or fertilizer mixes in preparation of the seed bed for planting. Two things are important—get on the required 1 pound of actual aldrin or heptachlor per acre and disk or work the material into the soil as soon as possible after application. The longer you delay this last step, the less effective the insecticide will become. Many farmers, when using a tractor mounted sprayer, pull a disk behind it and cover up the material immediately. When granular forms are used, a delay in working the materials into the soil is not as serious.

For broadcast of granular forms, a dry fertilizer spreader works well. End-gate seeders are difficult to use because it is hard to control the rate of application. Fertilizer mixes may be put on with a sprayer if they are liquids, or by use of fertilizer spreaders if they are granular mixes.

Advantages of broadcast or over-all applications are: no specialized equipment is needed (usually a sprayer or fertilizer spreader is available) and there is good carry-over and protection the second year following application.

ROW TREATMENTS

Aldrin or heptachlor in the three forms—granulars, liquid sprays, or fertilizer mixes—can be used in row treatments. Regardless of form, it is necessary to get on one-half pound of the actual insecticide per acre.

Depending on the equipment used, row treatments may be made as a band (along the side of the row), or as in-the-row treatment. When using liquid sprays for row treatments place the spray nozzle of the sprayer in each planter shoe to spray a band on the soil as it falls over the seed. This band of spray should be about 24 inches wide. In the case of listed corn, place the nozzles to spray behind the moldboard but ahead of packing wheels.

For row treatments with granulars, special granular planter attachments are required. Attachments that place the insecticide over and around seeds or slightly at the side and above the seed are available. The actual band may be 1 or 2 inches, depending on the attachment. With these methods, be sure insecticide does not come in contact with the seed. In using granular insecticide-fertilizer mixes, do not place this mixture at a level below the seed, but rather at the side or above the seed. If you want to use the fertilizer as a deep placement below the level of the seed, it would be better to get a granular attachment with double boxes and nozzles and to apply the fertilizer and insecticide separately. Split boots on planters are designed to place fertilizer and insecticide separately and in the right locations.

Although row treatments require special equipment, cost of treatment is only half that of broadcast. This factor produces decided savings on large acreages. With row treatments, however, there is little or no carry-over into the second year following application.

SOIL TREATMENT OR SEED TREATMENT

If you treat the soil, treating the seed with an insecticide is of no value. The soil treatment will control the major soil pests of corn including rootworms, wireworms (unless infestations are heavy, when the dosage of insecticide should be doubled), cutworms, seed corn beetles, and maggots. Seed treatments are designed to protect the seed from insect damage only from the time it is planted until it germinates. Thus seed treatments will protect the seed during this short period from seed corn beetles, seed corn maggots, and wireworms.

Deciding About Soil Insecticide Treatment

In areas where rootworms are a problem (south-east and south central), it will pay you to apply a soil treatment if corn is going to be planted on last year's corn ground. The longer corn has been grown continuously on the same land, the greater the chances are for damage from rootworms. Cost of treatment per acre will vary from \$1.40 to \$2.80, depending upon the method of treatment. Increasing the yield only 3 bushels per acre will pay for the treatment. Increases of from 5 to 10 bushels per acre are not uncommon following soil insecticide treatments.