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wireworm control in North Dakota

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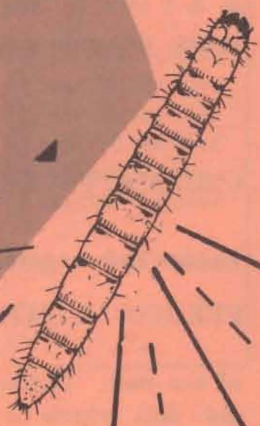

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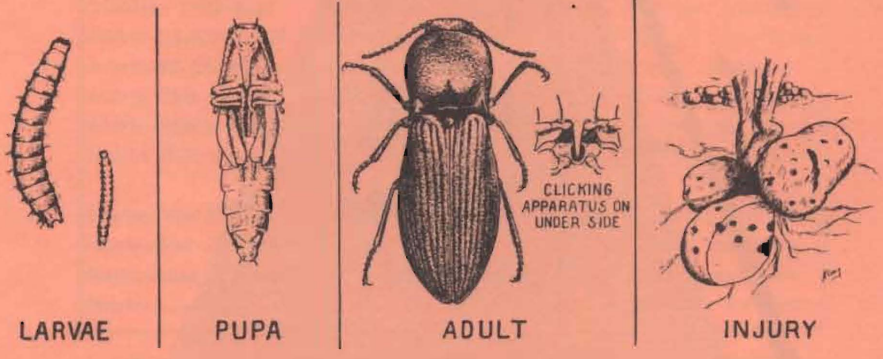
NORTH DAKOTA AGRICULTURAL COLLEGE

WIREWORM CONTROL

At least three species of wireworms in North Dakota are injurious to crops. Some appear in the early spring and attack the seed and young seedlings, others in the fall damage root crops such as potatoes and sugarbeets.

Wireworms prefer loose, light and well drained soils although they may also occur in the heavier clay soils during some seasons.

DESCRIPTION: The adult "click beetle" is dark in color and about ½ inch in length.



LARVAE | PUPA | ADULT | INJURY

Larvae are yellow to red-brown in color and vary in size up to 3/4 inch in length. They remain and feed in the soil for several years, depending upon species and feeding conditions.

CROPS ATTACKED: The pests prefer grass. However, they will attack small grains, corn, potatoes, sugarbeets and vegetables. Legumes are not likely to be injured

FEEDING HABITS: Wireworms do most of their damage in the early spring when they are near the surface of the soil. During the summer months the larvae move deeper into the soil where it is cooler and moisture supplies are plentiful. During the winter they hibernate about 6 to 10 inches below the surface of the soil.

HOW WIREWORMS DAMAGE CROPS: The larvae feed upon the germinating seed or upon the young seedling. Damaged plants soon wilt and die, resulting in thin stands. In a heavy infestation bare spots may appear in the field and reseeding is necessary.

Potato "seed pieces" are seldom damaged to a point where poor stands result. However, the new tubers can be damaged severely. Wireworm infested tubers have tunnels in them which allow disease organisms to enter. Wireworm damaged tubers are usually of less market value.

HOW TO CHECK FOR WIREWORMS: There is no easy way to determine the severity of infestation without taking soil samples. Infestations vary from year to year, depending upon the season. There also may be considerable variation within a field and between fields. Sometimes the past history of a field is a pretty good indicator, especially if wireworms have been a problem in previous years.

The soil sampling technique for determining wireworm infestations involves the taking of approximately 20 well spaced samples from each 40 acres of land. Each sample should be approximately 1 square foot of soil taken down to a depth of 3 to 4 inches. Spread each sample out on a piece of burlap or tarp and count the number of wireworms collected in the samples.

If you find:

0 to 5 wireworms in 20 samples, the field is safe for all crops, including potatoes.

5 to 8 wireworms in 20 samples, the field is safe for all crops, except potatoes.

9 to 15 wireworms in 20 samples, the field is safe for small grains only, not including corn.

20 or more wireworms in 20 samples, damage is likely to occur to all crops. Such fields should be treated with an insecticide, seeded to legumes or summerfallowed.

Types of Seed Treatment

DRY OR DUST METHOD: Insecticides may be applied to the seed in any type of treater that will give uniform coverage. In small lots of seed, hand treating will be satisfactory. However, it is extremely important to avoid over-treating or overdosing. Insecticides may also be applied in combination with a fungicide.

SLURRY TREATER: Several different types of slurry or wet treaters are on the market. It is suggested that you check with the slurry representative for information on materials best adapted to the particular treater.

Usually, the more concentrated wettable powders work the best in slurry treaters. There also are a few liquid insecticide formulations recommended for slurry treaters. Before using an emulsifiable concentrate, check to see if the insecticide has been formulated specifically for seed treatment. Most agricultural insecticidal formulations are not suitable and, if used, may cause serious injury to the seed.

DRILL BOX APPLICATION: For growers who do not have custom treaters available the drill box method of treatment may be helpful. This method of treatment involves some problems such as poor application of the insecticide to the seed, settling out of the insecticide in the drill box, uneven distribution of the insecticide in the drill row, etc. Aldrin, dieldrin, heptachlor and lindane may be used at rates suggested for seed treatment.

SOIL TREATMENT: This method is recommended primarily for potatoes and sugarbeets. The insecticide is applied to the soil as a dust, spray or granules, then worked into the soil to a depth of 4 to 6 inches immediately after application. Treatment should be in advance of seeding time.

Suggested Control Methods

CULTURAL CONTROL: This includes any cultivation or seeding practice which will discourage wireworm feeding in the field. Such practices as shallow tillage, shallow seeding, seeding with press drill and clean summerfallow are all helpful in reducing wireworm damage.

CHEMICAL CONTROL: Several insecticides are now approved for use as seed treatments or soil applications for the control of wireworms. Insecticides applied to the seed just before planting time is an inexpensive means of preventing wireworm damage to growing crops. For maximum benefits, treat shortly before seeding as prolonged storage after treatment is generally not advisable.

Seed treatment is primarily a protective measure and does not necessarily result in eliminating the wireworm menace from a field. Soil treatment, although more expensive than seed treatment, will provide control for two or more seasons and in most instances the wireworms are effectively controlled.

SEED TREATMENT

INSECTICIDE	RECOMMENDED DOSAGE	
	SMALL GRAINS*	SUGARBEETS
Lindane 25% wettable powder	4 ozs/bu	— — —
Lindane 75% " "	1 1/3 oz/bu	— — —
Dieldrin 50% " "	2 oz/bu	16 ozs/100 lbs seed
Dieldrin 75% " "	1 1/3 oz/bu	11 ozs/100 lbs seed
Heptachlor 25% " "	4 ozs/bu	32 ozs/100 lbs seed
Aldrin 25% " "	4 ozs/bu	32 ozs/100 lbs seed
Aldrin 50% " "	2 ozs/bu	16 ozs/100 lbs seed
Aldrin 75% " "	1 1/3 oz/bu	11 ozs/100 lbs seed
Aldrin 30% emulsifible concentrate	3 1/3 ozs/bu	26.4 ozs/100 lbs seed
BHC-Mercury Combination (40% BHC-1.93% phenyl mercury)	2 oz/bu (not for corn)	— — —

* all grain crops including corn

1 ounce equals approximately 3 tablespoonsful, dry weight

1 fluid ounce equals approximately 2 tablespoonsful.

The two types of soil treatment are broadcast and band treatment. The broadcast method involves the application of insecticide over the entire field, while the band treatment consists of treating only along the rows of the crop grown. The broadcast method is preferred.

RECOMMENDED DOSAGES FOR BROADCAST TREATMENT

INSECTICIDE	DOSAGE*
Dieldrin 15.8% emulsifiable concentrate	2 gals. per acre
Dieldrin 50% wettable powder	6 lbs. per acre
Dieldrin 10% granules	30 lbs. per acre
Dieldrin 1½% dust	200 lbs. per acre
Aldrin 23.41% emulsifiable concentrate	1½ gals. per acre
Aldrin 40.0% emulsifiable concentrate	3 qts. per acre
Aldrin 25% wettable powder	12 lbs. per acre
Aldrin 25% granules	12 lbs. per acre
Aldrin 2½% dust	123 lbs. per acre
Heptachlor 23.41% emulsifiable concentrate	1½ gals. per acre
Heptachlor 25% wettable powder	12 lbs. per acre
Heptachlor 25% granules	12 lbs. per acre
Heptachlor 2½% dust	123 lbs. per acre

* When using the emulsifiable concentrates or wettable powders, add enough water to adequately cover 1 acre.

NOTE: Soil treatments with lindane or BHC are not recommended for potatoes, due to taste contamination of the new tubers.

PRECAUTIONS:

Use recommended dosages.

Treat only sound grain.

Remember that seed treated with an insecticide or fungicide must not be sold on the market, except as seed, nor should it be fed to livestock.

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