WIREWORM CONTROL Irrigated Farming

Recommendations for
Potatoes, sugar beets, onions, beans and corn
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Wireworms live in the soil and feed on the underground portions of plants. Damage to crops include destroying seeds and seedlings and injuring tubers, bulbs and roots. In spring wireworms may cut off and kill seedlings or hollow out sprouting corn and bean seeds causing thin plant stands and bare areas. They also feed on roots and stems of young plants, reducing vigor. Later in the season they scar and tunnel maturing potato tubers and onion bulbs or roots, reducing the market value of these crops.

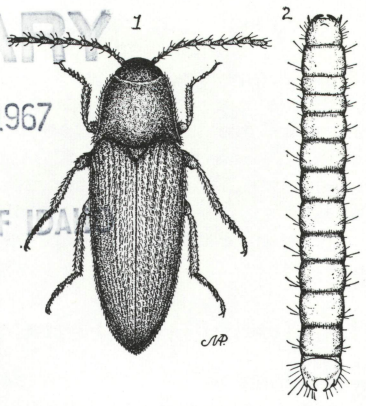
Control of Wireworms Is Complicated

1. Chlorinated hydrocarbons previously used to treat soils to protect crops from wireworm attack are near the end of their effective life. Therefore, re-treatment may be necessary soon.
2. The slow killing action of DDT and the fact that it must be applied 24 months or 2 growing seasons before sugar beets can be planted in the treated soil requires planning crop rotation and land use 1 to 3 seasons in advance.
3. Diazinon and parathion granular soil treatments are approved for current season wireworm control. Both are short-lived in the soil. For application of these insecticides to be effective, they must be carefully timed with the wireworm's seasonal activity. Where diazinon and parathion are used, the soil must be re-treated every other year to insure protection of susceptible crops.

Description

Wireworms are hard-bodied, slender, cylindrical, shiny, yellow-to-brown larvae or "worms". When full grown they are ¾ inch in length. They have 3 pairs of legs, which cannot be seen from above, and are slow moving. The last segment of the body is pronged or forked. The adults are the familiar click beetles which are slender, tan-to-brown-to-black beetles about ⅓ to ½ inch in length.

Many different kinds of wireworms are found in Idaho soils. The predominant species on irrigated lands are the Pacific Coast wireworm[1] and sugarbeet wireworm.[2]



1. Wireworm beetle 2. Wireworm larva
(Courtesy Colorado State University)

Seasonal and Life History

The life cycle of Idaho's predominant wireworm species requires three to four years for completion under favorable conditions. Wireworms spend the winter in the soil as partially grown larvae or as new adults in overwintering cells. The adults leave the soil in the spring when the soil temperature reaches 55°F or higher. The adults mate, and the females return to the soil for egg-laying.

Wireworms in the adult stage feed little if at all and cause no damage. Each female will lay up to 300 eggs in moist soil at depths of from one to several inches and then die. The eggs hatch in 2 to 4 weeks. The newly hatched larvae, no longer than 1/16 inch, are subject to a high mortality. This, coupled with the fact that females do not readily migrate, probably accounts for the spotty appearance of wireworm infestations in many of our fields. Soil preferences for egg-laying sites and for larval establishment determine where irrigated wireworms will occur and predominate.

The larvae cause severe feeding damage during their second and third year. In the spring when soil temperatures reach 50°F, wireworm larvae move upward toward the soil surface from depths of 6 inches or more where they have spent the winter. When soil surface temperatures reach 80°F and higher and soil moisture conditions are less than optimum they move downward again.

During the third and fourth seasons, mature larvae transform to fragile pupae in earthen cells. Adults emerge in 3 to 4 weeks and remain inactive in the soil until the following spring at which time a new generation is started. Wireworms in all stages of development may be present in the soil during any growing season.

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[1] **Limonius canus** LeConte
[2] **L. californicus** (Mannerheim)

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Control

There is no easy method for determining severity of infestation or potential for damage when dealing with wireworms. Infestations and damage will vary within a field and between fields and will vary from year to year. Sometimes past cropping history, records of previous soil treatments, or previous damage serve as indicators. Soil sampling is an aid to estimating wireworm populations and serves as a basis for control measures. Contact your County Extension Agricultural Agent for details on sampling techniques and procedures.

Complete Treatment — Best Control

DDT—will continue to be recommended in Idaho where potatoes, onions, beans and corn will be grown. DDT is very effective when properly applied. Its killing action is slow. It must be applied not later than August the summer prior to planting these crops for satisfactory control of mature wireworm larvae. The DDT soil treatment is **not** recommended for sugar beets. **To prevent residues in sugar beet pulp, DDT must be applied 24 months or 2 growing seasons ahead of planting beets.** Crops planted in DDT-treated soils will be protected from wireworms for at least 8 years.

Diazinon and parathion granules—are recommended for use where potatoes, onions, beans, corn and sugar beets will be grown. These organophosphorus insecticides remain toxic to wireworms in the soil for **no longer** than 6 weeks. Therefore, to be effective they should be applied only when the wireworms are in the top 6 inches of soil, usually when the temperature has reached 50°F at a 6 inch depth. Apply as close to planting time as possible. Use only granular formulations and observe the safety precautions.

Caution — Poison

Soil fumigants—are necessary to control nematodes and will also control wireworms. Fumigants are expensive and application for wireworm control alone is impractical for large acreages. For details on the use of fumigants, see Experiment Station Bulletin No. 380.

Other insecticides—with federal clearance will control wireworms. However, Idaho crop rotations prohibit their use because of illegal residues at harvest.

All of the insecticides used for wireworm control can be poisonous to both man and insects. This is especially true for the organophosphorus insecticides. They are safe to use in granular form when all safety precautions prescribed on the labels are strictly followed. Parathon is extremely toxic while diazinon is moderately toxic. When using parathion, humans and animals must be kept off the treated area for 48 hours.

The first rule in using insecticides safely is, before opening the container, to read the insecticide label and completely understand the directions. Secondly, follow the manufacturer's suggestions on safety precautions to the letter.

Pesticide Residues

These recommendations are based on the best 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 recommendations carefully with respect to dosage levels, number of applications, and minimum interval between application and harvest.

THE GROWER IS RESPONSIBLE FOR residues on his crops as well as for problems caused by drift from his property to other properties or crops.

CHEMICAL CONTROLS FOR WIREWORMS

INSECTICIDE	APPLICATION		LIMITATIONS
DDT—wp, ec	**Spray 10 pounds actual per acre**	**Application must be followed immediately with disking, plowing and cross-disking to thoroughly mix the insecticide with the soil to a depth of 6 to 8 inches.**	**DDT is to be used only when applied the summer prior to planting potatoes not later than August and at least 2 years prior to planting sugar beets. Do not use 50% DDT granules.**
Diazinon 14G	**Broadcast 3 to 4 pounds actual per acre**		**Diazinon and Parathion . . . Incorporate immediately into the upper 6-9 inches of the soil before planting. Soil temperature must be at least 50°F when applied. Use higher rates with cooler soils. Use only granular formulations.**
Parathion 10G See caution above.	**Broadcast 4 to 6 pounds actual per acre**		

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