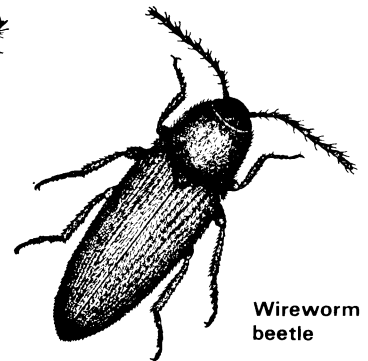


# WIREWORMS



Wireworm larva



Wireworm beetle

## Estimating the Infestation and Damage They Do

Gene Carpenter

Controlling wireworms will add to the cost of growing a crop but may be necessary to realize a profit. This is especially true if you are growing a root crop or potatoes.

Wireworms are hard-bodied, slender, cylindrical, shiny yellow-to-brown larvae or "worms". When full grown, they can be 3/4 inch in length. Wireworms are slow moving insects with 3 pairs of legs. The last segment of the body is prolonged or forked.

Adult wireworms are click beetles. The adults are slender, tan-to-brown-to black beetles 1/3 to 1/2 inch in length.

You can find wireworms in most cropland areas of Idaho. The Great Basin wireworm invades dryland areas and desert lands just brought into irrigated crop production. The sugar beet wireworm is the most common wireworm in the irrigated fields of Idaho.

Since DDT can no longer be used for control, wireworms may reinfest irrigated land as current DDT residues dissipate. The sugar beet wireworm is especially likely to reappear. Many growers will not be expecting wireworm damage, so will suffer losses.

Growers should check fields to see if wireworms are present. Having 2 to 5 wireworms per square foot can cause damage to most seeded and transplanted crops in the spring. As few as 0.1 per square foot can cause economic damage to a potato crop.

### Methods of Survey

Surveying for wireworms and determining wireworm populations are not easy. Baiting gives a very poor estimate

of the population but is a quick way to see if wireworms are in a field. The best method, soil sampling, gives a good estimate. If wireworms are found, you can use soil sampling to estimate the number per square foot (density).

### Baiting

Carrots and coarse ground whole wheat flour buried about 3 inches in the soil are good baits. Mark the bait location with a marker. After 2 to 3 days, dig up the bait and check for wireworms. Baits do not work in soil that is too dry or wet and may not work if too much organic residue is present. If you use flour, wrap 2 to 3 tablespoons in a scrap of nylon mesh with the tail end of the mesh protruding from the soil. Randomly place these baits in a field. The

more bait locations you use, the greater your chance of discovering an infestation.

### Soil Sampling

Most of the modern soil sampling schemes utilize 1/4 square foot samples. These can be either 6 3/4 inch post hole digger samples or 6 inch square samples. The depth varies depending on the season of the year. Dig samples 18 to 24 inches deep when soil temperatures are 50 degrees Fahrenheit or above 80-85 degrees or the soil is very dry. Fig. 1 indicates the depth at which you can find irrigated land wireworms at different seasons and soil temperatures. Dryland wireworms are suspected to be active at lower temperatures but not enough information is known to construct a similar chart for them.

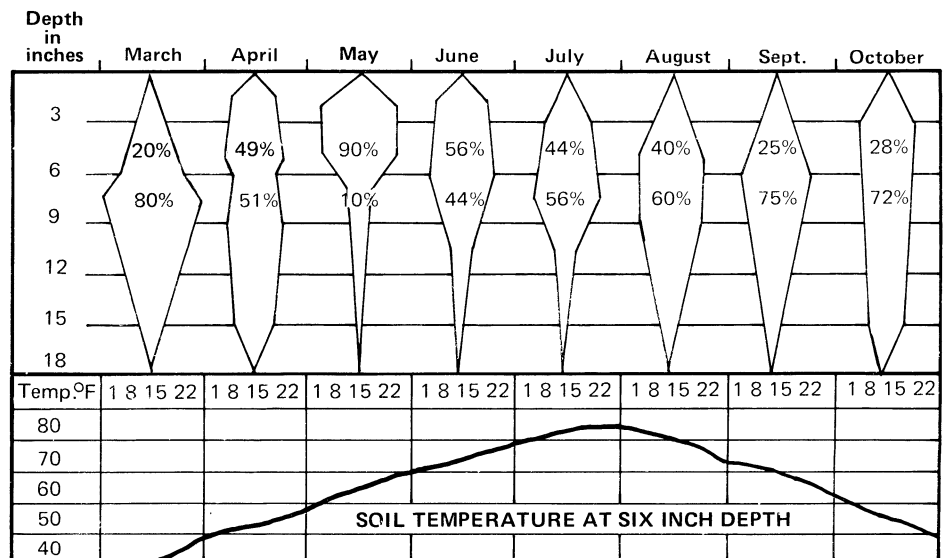


Fig. 1 — Depth of wireworms in soil as related to season and soil temperature. These data are based on irrigated-land wireworms and do not necessarily apply to dry-land wireworms.

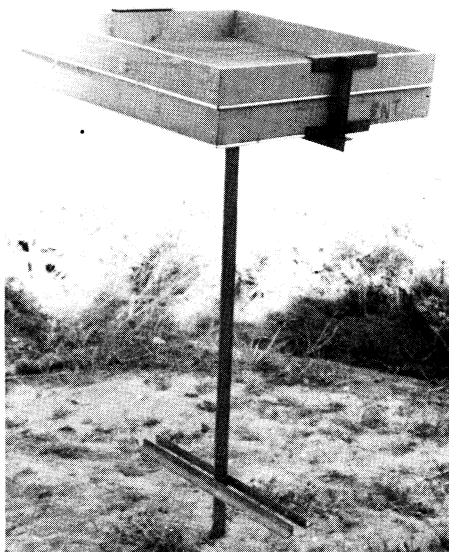


Fig. 2 — Sieve for sifting soil samples to determine density of wireworm infestation.

Carry the samples to the sieve in buckets. The sieve is usually two 18 to 20 inch square wood frames — one with 1/4 inch hardware cloth and the other with 8 to 16 mesh window screen. A frame welded to the end of a length of spring steel or strap iron holds the wood frames together (Fig. 2). Make the spring steel long enough so a person can grab the sides of the wooden sieve to shake the frames back and forth. Weld or bolt on angle iron for a foot.

Avoid using wet soil samples. Also, do not take all samples from stubble rows or other concentrations of organic residues. Wireworms tend to gather about that residue.

Because wireworms are not uniformly distributed throughout a field, randomly take samples over the entire area of the field. Take 20 samples in a 10-acre field, 60 samples for 40 acres, and 100 samples for 110 acres.

If you should find that the wireworms are restricted to only a small segment of the field, you may wish to sample that area as you would a separate small field. This would tell you whether that small part of the field should receive special treatment. Or, if the wireworms are too numerous, you may wish to plant a less susceptible crop there.

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wireworms found. Extend the ruler on the right, which will reveal the density of wireworms per square foot.

The nomograph has a zero point on the central bar, "No. of Wireworms". This point was included so you could accept with confidence the results of a sampling program yielding no wireworms. If a line drawn through the zero point indicates the possibility of a wireworm population greater than you can tolerate, you should take more samples.

If you are planning to grow potatoes, look at Fig. 4. After determining density from Fig. 3, find that density number on the bottom line of Fig. 4. Follow a perpendicular line from this point to the diagonal line, then draw a line parallel to the base through this diagonal line point, extending the line to the left scale. Read the estimated damage that number of wireworms can cause to a potato crop.

USDA standards for U.S. No. 1, U.S. Commercial, and U.S. No. 2 potatoes allow only 6% external defects. This includes dirt or other foreign matter, sunburn, greening, growth cracks, air cracks, scab, rhizoctonia, and mechanical damage, as well as insect damage. If you make an allowance for defects other than wireworm damage, you are limited to about 4% wireworm injury. Plan your control program based on total external defects.

Contact your County Extension Agent or read Idaho Current Information Series No. 197, Wireworm Control on Irrigated Farms, for information on insecticides to use for control.

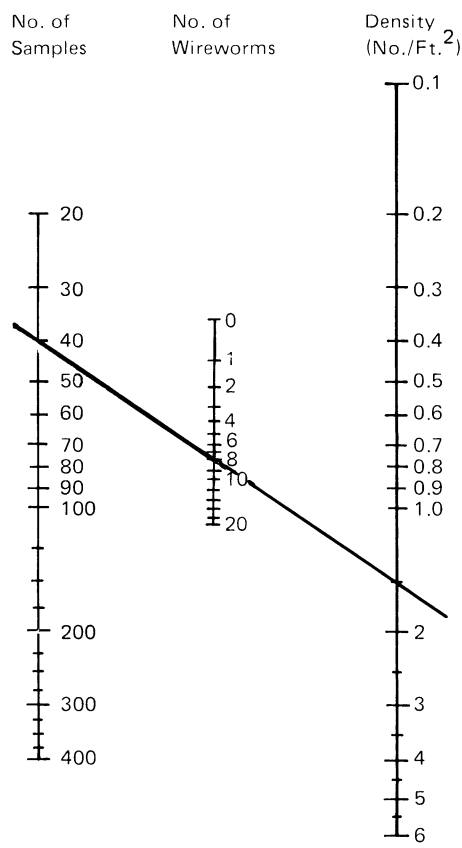


Fig. 3 — Nomograph used to convert the number of wireworms found in a given number of 1/4 square foot samples to the number per square foot.

### Interpreting What You Find

You can determine the number of wireworms per square foot by using a nomograph (Fig. 3). To use this nomograph, place a ruler on the number of samples taken and on the number of

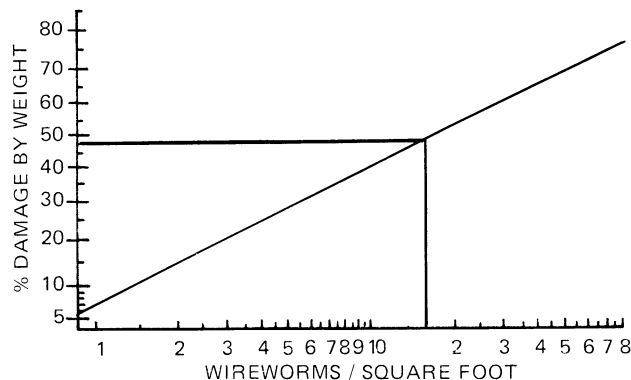


Fig. 4 — Graph used to estimate the damage to potatoes which a given density of wireworms can cause.