

WHAT IS THE WIREWORM SITUATION IN WASHINGTON?

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Nearly 100 kinds of wireworms are present in the Pacific Northwest. Three species cause most damage to potatoes, chiefly in eastern Washington. These are the Great Basin wireworm (Ctenicera pruinina (Horn)), the Pacific Coast wireworm (Limonius canus LeConte), and the sugar-beet wireworm (L. californicus (Mannerheim)). Short descriptions of these insects and some knowledge of their habits and vulnerability to control may be helpful in identifying wireworms you may find on your farm and in planning measures to control them.

The three species of wireworms are native to Washington. Before eastern Washington was farmed, the Great Basin wireworm fed chiefly on the roots of bunch grass in the vast, dry areas receiving less than 15 inches of rainfall annually. When dry-land farming started about 70 years ago, the wireworm found roots of wheat as well as those of other grains to be satisfactory food. At the time irrigation first came to the Columbia Basin, the Great Basin wireworm was equally at home in virgin bunch grass areas and in fields alternately planted with grain and summer fallowed.

In eastern Washington, the Pacific Coast and sugar-beet wireworms originally were restricted to certain small, subirrigated areas near streams and potholes. From about 1920 to 1940 these "wet-land" wireworms spread throughout the older irrigated Yakima Valley and frequently damaged potatoes and many other crops. Wet-land wireworms were known to occur in a few, small, moist areas of the Columbia Basin as early as 1942, but appreciable damage in Columbia Basin Project fields was not reported until 1959 and 1960. Wet-land wireworms are spreading slowly and, although relatively few crops have been damaged by these worms so far, small numbers may be present over a much greater area than has been recognized.

The Great Basin wireworm requires at least 3 years to complete its growth, or life cycle. Some Pacific Coast and sugar-beet wireworms mature in 2 years, most require 3 years, and others 4 or more years. Worms confined on a near-starvation diet at the Walla Walla laboratory did not become full-grown until they were 10 years old.

Adult wireworms are slender, hard-shelled beetles 1/3 to 1/2 inch long. They are known as snapping or click beetles because of the noise they make by flexing their body parts during the process of turning over from an upside-down position. Adults of the Great Basin wireworm are jet black; the Pacific Coast wireworm and sugar-beet wireworm are reddish brown, except that the sugar-beet wireworm is shiny black on the bottom back of the legs. Males of all species are slightly smaller than the females.

Wireworm adults emerge from the soil during warm sunny days in March or April and mate almost immediately. The females burrow into the soil, frequently to a depth of 3 or 4 inches, where each lays from 50 to 300 or more eggs. Most

eggs are laid by the Great Basin wireworm, followed by the Pacific Coast and sugar-beet wireworms. After most of the eggs have been laid, some females may emerge and fly a short distance--rarely more than 1/8 mile--and continue egg laying. It is believed that wireworms spread chiefly by means of the erratic, short flights of the nearly spent females.

Wireworm eggs hatch in 3 to 4 weeks and the small larvae start crawling through the soil in search of food. If the worms encounter potato seed pieces, roots, or developing tubers, they may remain and feed in the same hill of potatoes throughout the season.

Most growers are familiar with the slender yellow, orange, or brown jointed but wirelike larvae that scar the surface and tunnel into potatoes, thus making them unsalable for food. Wireworms spend at least the first winter of their life as partly grown larvae in the soil, but the following August a few of the most rapidly developing individuals of the Pacific Coast and sugar-beet wireworms may transform to a delicate, immobile pupal stage. Later the same season some pupae may change to adults, but these remain in their earthen cells until the following spring. Other larvae of the same species may spend 2 or more winters in the larval stage. Pupae of the Great Basin wireworm first appear in their third year.

All wireworm eggs and the larvae of the Pacific Coast and sugar-beet wireworm are unable to stand desiccation and die when the soil dries out. Thus, cultivation and drying of the soil during April and May will kill many wireworm eggs and larvae, but early seeding and watering of crops usually takes place at this time and thus favors, rather than prevents, wireworm development. Late spring planting or early harvest of crops and drying out the fields in September help keep wet-land wireworms at low levels. Larvae of the Great Basin wireworm, on the other hand, are accustomed to dry soil and most of them die the first or second year in which a field is irrigated. If the grower continues to irrigate the field, this species of wireworm can not become established again, and no wireworm problem should occur until the wet-land wireworms have spread into his district.

Although grasses and wheat are preferred hosts of the Great Basin wireworm, Russian thistle, tumble mustard, and tumbleweed are acceptable hosts on summer-fallow or abandoned land and should not be allowed to grow on land to be farmed the next year. The Pacific Coast wireworm is especially productive on red clover, and fields to be planted to potatoes the following year should be sampled to determine whether wireworms are already present.

After several years of irrigation, the Pacific Coast wireworm is most likely to be present in sandy loam soils, whereas the sugar-beet wireworm is better suited to clay loam soils. Both species occur in the Yakima Valley although in different proportions, depending on the physical properties of the soil. Most of the wet-land wireworms in the Ellensburg area are chiefly sugar-beet wireworms.

Although a few sugar-beet wireworms have been found near the lake south of Moses Lake, the wet-land wireworms found on the northwest side of the lake at Winchester, Trinidad, and Burke have all been of the Pacific Coast species. Because of the predominance of this species to date, and its partiality for sandy soils, we may expect it to spread and multiply most rapidly. After red

clover, it prefers potatoes. Beans and corn are moderately favorable host plants. The planting of alfalfa for several years may completely eradicate the Pacific Coast wireworms; however, even in alfalfa fields, the sugar-beet wireworm will be able to survive and increase at a very slow rate.