

## THE ECONOMIC WIREWORMS OF THE PACIFIC NORTHWEST

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Wireworms, the larval stage of click beetles (Coleoptera: Elateridae), are re-emerging as significant soil-dwelling insect pests of a wide variety of field crops in North America and globally. Wireworms are generalist herbivores that feed on crop roots, seeds, and stems, resulting in increased weed pressure and reduced stands, yields, and profits. When wireworm populations reach high densities, the yields of entire crop fields can be lost. Major crops affected in the Pacific Northwestern United States include cereals (barley, wheat, rye), potatoes, corn, and legumes, although damage to cereals is often most severe (Figure 1).



**Figure 1.** Wireworm damage to wheat

Historically, wireworms were effectively controlled with inexpensive and potent broad-spectrum insecticides. However, the recent removal of many broad-spectrum insecticides from cropping systems has led to the re-emergence of wireworms.

Unfortunately, the “low pest status” of wireworms from the 1950's until recently resulted in little research on the biology and ecology of these pests, and thus we lack the fundamental knowledge to develop new management strategies.

Our preliminary results from insecticide trials showed that currently available insecticides do not significantly eliminate wireworms from fields. Moreover, our results suggest that the different wireworm species may vary in their susceptibility to various chemistries. What is needed is a better method for growers to assess the risk and determine when to treat their seed, and which products to use for various species. Therefore, recognizing species is important for understanding variations in damage and control due to differences in species biology, feeding behavior, insecticide susceptibilities, and crop impacts.

In 2012 and 2013, we conducted a first large-scale field survey of wireworm species in cereal fields of the Pacific Northwest. The survey revealed thirteen wireworm species found, although three species accounted vast majority of individuals collected. In addition to collecting wireworms, soil samples were collected from surveyed farms as well as climate data, crop rotation data, and management data. Distributions of all of these species, as well as their associations with climatic factors will be presented and discussed.