

**Newly Registered Insecticide in Potato Seems Promising for Reducing Wireworm Damage**

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**W**ireworms are the larval stage of click beetles (Coleoptera: Elateridae) and are considered the most important soil-dwelling pests of crops in the Pacific Northwest. They are becoming increasingly important in several other regions in the U.S. Possible explanations for increasing damage to crops are increased rotations with grasses for the cattle/dairy industry or small grain/soybean production, relatively mild winters in the last several years, and the loss of registration of insecticides with long residual soil activity. Wireworms are a significant problem in potatoes because their larvae can damage them in two ways: 1) by feeding upon seed pieces during the spring resulting in poor or weak stands of potatoes and 2) more importantly, by burrowing into developing tubers reducing tuber quality for processing and fresh-pack use. In some years up to 45% of the total potato harvest has been down-graded from a classification of U.S. No. 1 to U.S. No. 2 because of wireworm injury. In the processing industry, there is a zero tolerance for the presence of wireworm in the raw product because the hard body of this insect is classified as foreign material.

Management options for wireworms are limited by an incomplete knowledge of their biology and the inability to reliably predict fields at risk. The life cycle of our most common wireworms requires up to 6 years. Therefore, once a field is infested, it remains infested for a long time. Growers in the U.S. rely on a few registered insecticides, which are not always effective for control of wireworms. However, a newly registered insecticide in potatoes seems to provide good, reliable reduction of wireworm damage under Idaho conditions. Experiments conducted at the University of Idaho Kimberly Research and Extension Center evaluated the effectiveness of several chemical treatments. The efficacy of labeled and non-labeled insecticide products in these experi-

ments was assessed in the last 5 years (except 2005). Relatively new chemistries that are currently labeled in potatoes for control of other insect pests such as Colorado potato beetle and aphids (for example the neonicotinoids imidacloprid [Admire®] and thiamethoxam) were included for experimental purposes only. Different application methods (seed treatments, band applications, and in-furrow at planting treatments) and different formulations (granular and liquid treatments) were assessed.

Because of the patchy distribution of wireworms in the ground, individual treatment plots had individual controls on both sides of the plot. The experiment was replicated for four years (2003-2004-2006-2007). Tubers from both treated and check plots were harvested, weighed, examined for wireworm feeding damage, and data combined for the untreated control. For the percentage of affected tubers, a tuber with one or more wireworm holes was considered an affected tuber. One additional experiment that included a soil fumigant was conducted in 2006. Fumigation treatments with Telone® were conducted the previous fall (August 29, 2005) by a commercial applicator. All other insecticide treatments were applied in the spring pre-planting and also as in-furrow at planting at label rates.

**Results:** With the exception of neonicotinoid insecticides (which are labeled for control of other insect pests in potatoes as explained above), all insecticides labeled for wireworm control provided reduction in the number of damage sites per tuber when compared to the untreated control. Neonicotinoid insecticide treatments presented equal or higher damage than the controls. **The insecticide Regent®, which was recently labeled for use in potatoes, consistently provided the lowest number of holes per tuber and also the lowest percentage of affected tubers during the four years of this study (Fig. 1).** The mean number of

holes of the experimental-insecticide treatment was not statistically significantly different compared with Mocap® and Thimet® treatments in two of the four years.

The experiment that included fumigants in 2006 indicates that Telone II® (Telone® label states that the product suppresses wireworms) is an effective option for reducing wireworm damage since all Telone II® treatments presented a low number of holes per tuber and low percentage of affected tubers when compared to control rows. However, these treatments seem to affect the quality of the potato tubers since all the Telone II® treatments resulted in a lower tuber weight and percentage of U.S. No. 1 tubers (data not presented). **Plots treated with Regent® also had the highest percentage of U.S. No. 1 tubers.** In conclusion, from the few insecticides registered at this time, Regent® seems to provide the best reduction in wireworm damage under Idaho conditions.

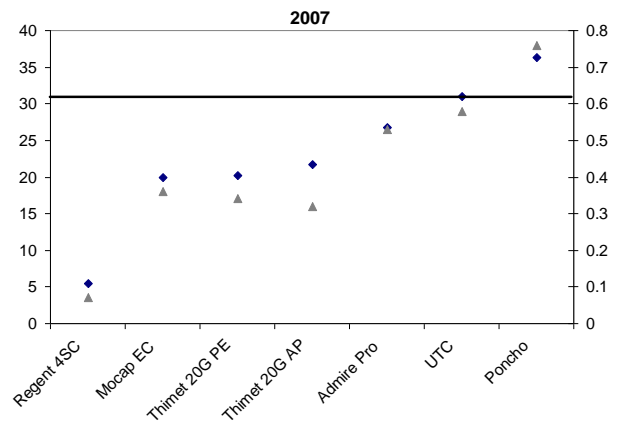
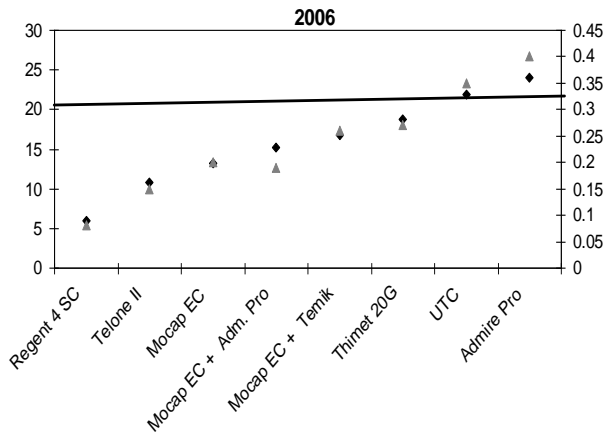
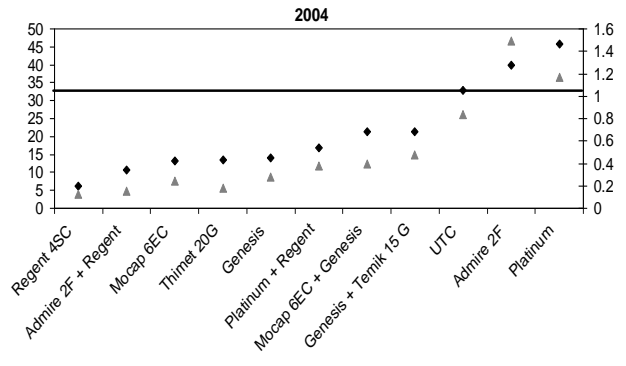
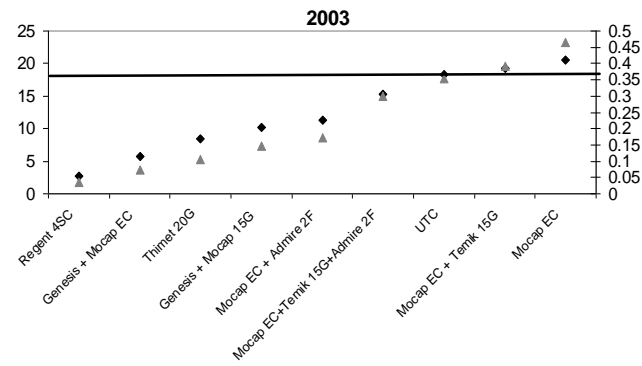
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This article discusses chemicals that are labeled for potatoes, but not for wireworm control. These chemicals were used only for experimental purposes. A chemical can be used for wireworm control only if the label states the product can be used for wireworm control. The label is the law. Always read and follow all label directions. Where trade names are used, no discrimination and no endorsement by University of Idaho Extension are implied.

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Figure 1. Effect of various insecticides on the reduction of wireworm damage on potato tubers in four years. The left Y axis (black diamonds) represents the percentage of affected tubers (a tuber with one or more wireworm holes was considered an affected tuber). The line indicates the percentage of affected tubers in the untreated control (UTC). The right Y axis (grey triangles) represents the average number of wireworms per tuber.



**Did You Know?**

Click beetles have a mechanism on their underside that aids them in defense and righting themselves.

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