

**RESISTANCE MANAGEMENT OF POTATO TUBERWORM
IN THE PACIFIC NORTHWEST**

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Potato tuberworm is responsible for more crop losses in potatoes than any other insect, weed, disease or nematode pest in the world. The recent introduction and spread throughout most of the potato growing areas in the PNW has resulted in significant pest control challenges. Growers in the Columbia Basin of Oregon and the lower Columbia Basin of Washington made up to 8 applications in 2005 to control this pest. In most cases, the insect was control, however, several fields (between 5 and 10) were rejected due to PTW and were used for lower valued purposes.

Based on 2005 efficacy trials, PTW can easily be controlled by repeated insecticide applications made at close intervals at high rates. PTW has multiple, overlapping generations, short generation times, appears to infest only potatoes (at least in the PNW) and is the recipient of intense insecticidal pressure. The insect has developed resistance to most of the insecticides used for its control in several locations. Due to several factors related to its biology and the intense insecticide pressure it is under, the specter of insecticide resistance must be considered.

The potato industry must incorporate the likelihood of resistance into its management plans for PTW. The PNW potato industry is very fortunate to have identified a number of products that are effective for control of PTW. Products from nine separate classes of insecticides

Based on efficacy trials conducted in 2005, products with some level of activity against PTW include Imidan, Guthion, Monitor, Penncap M, Assail, Venom, Leverage, Baythroid, Asana, Avaunt, Rimon, Lannate, Furadan, Success/Entrust, Agrimek, Bacillus thuringiensis. Other products in the process of being registered on potatoes or not in the registration process for potatoes also demonstrated activity against PTW.

In total, the products represent nine different modes of action. The above named products included two types of acetylcholine esterase inhibitors, sodium channel modulators, two types of nicotinic acetylcholine receptor agonists, chloride channel activators, a voltage-dependent sodium channel blocker, a microbial disrupter of the midgut and a ninth mode of action that is unknown to the author.

It is highly unusual for growers to have access to some many products from such a diverse array of modes of action for use against a new pest. All of these products have use limitations, variable costs, label restrictions, differing levels of efficacy and spectra of control making grower choice complicated. It is currently recommended that growers rotate the choice of products in such a way that three modes of actions are used in a full PTW control program.

Researchers are currently developing PTW control programs that integrate chemical and non chemical control methods. It is critical that integrated resistance management principles are incorporated while PTW IPM programs are being developed.