



Colorado Potato Beetle: Effective Chemical Control

Colorado Potato Beetles (CPB) have challenged the world's potato industry for decades. In production areas where these pests do not exist, producers and governments strive to maintain a CPB-free status. Where they do exist, CPBs cause crop losses and increase production costs.

Background

Since the early 1990s, control of this pest has become more complicated because CPBs have developed resistance to insecticides in many parts of the world. One reason chemical resistance has developed is because historically, rotating chemicals with different mode of action sites was not encouraged to a great extent.

Researchers and producers now know that one of the key methods to prevent the development of chemical resistance is to alternate pesticides from different chemical groups.

Alberta situation

Fortunately, Alberta beetle populations are still susceptible to commonly used pest control products. To maintain this

advantage, producers must use chemicals from different groups. However, resistance could still develop in Alberta.

Some chemicals currently registered for use on potatoes are being reviewed by the Pest Management Regulatory Agency and may not be available in the future. In addition, some chemical control products that are effective in Alberta are not registered for use on potatoes in the United States, so these products cannot be used on potatoes with an end-use designated for export. Both these reasons could lead to increased beetle resistance in Alberta as both conditions restrict the number of products available to Alberta growers.

Assessing resistance

Many have tried to estimate the degree of CPB resistance in southern Alberta. In the 2003 and 2004 growing seasons, an industry-sponsored survey was conducted to determine the level of CPB resistance. CPBs were collected from potato fields across southern Alberta. Samples were sent to the Lethbridge Research Station where they were tested for resistance.

The chemicals in the following table were evaluated for their effectiveness in controlling CPBs.

Chemical	Class	2003	2004
		Average % control	Average % control
Control (no chemical)		1%	0%
Pounce (permethrin)	pyrethroid	93%	100%
Guthion (azinphos methyl)	organophosphate	97%	100%
Thiodan (endosulfan)	organochlorine	92%	98%
Sevin (carbaryl)	carbamate	44%	not tested
Admire (imidacloprid)	chloronicotine	100%	99%
Malathion (malathion)	organophosphate	57%	not tested

These observations led to the conclusion that the CPB population in southern Alberta has developed some resistance toward Sevin (carbaryl) and Malathion (malathion), but the other insecticides still performed at an acceptable level. However, because of the limited number of products available, it is vitally important that Alberta growers alternate chemical groups to minimize resistance.

Chemicals available

Currently, Assail is one new product available for aerial application through an emergency use registration. Assail has emergency use registration for the 2006-growing season only. If full registration is not granted before spring of 2007, a new emergency registration request will have to be submitted.

The following chart provides a brief look at insecticides with CPB control on their labels. The chemicals listed are registered in both Canada and the United States and are approved by processors for use on Alberta's commercial potato acres.

This table is meant only as a guide. Some of the insecticides in the above chart may be more effective for controlling CPBs than others. Some chemicals are very weather-dependent. Please read chemical label for mixing instructions, application rates and timing of application.

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Chemical	Group	Chemicals family	Method of application
carbofuran	1A	carbamates	ground
carbaryl	1A	carbamates	air/ground
azinfos methyl	1B	organophosphates	ground
malathion	1B	organophosphates	air/ground
methamidophos	1B	organophosphates	air/ground
diazinon	1B	organophosphates	ground
phorate	1B	organophosphates	in-furrow
endosulfan	2A	chlorinated cyclodienes	ground
deltamethrin	3	synthetic pyrethroids	air/ground
permethrin	3	synthetic pyrethroids	air/ground
imidacloprid	4	chloronicotines	ground/in-furrow
acetamiprid	4	chloronicotines	ground/ER 2006 air
Bt based insecticide	5	biological – <i>Bacillus thuringiensis</i>	ground
spinosad	5	biological – <i>saccharopolyspora spinosa</i>	ground