



BIOLOGICAL CONTROL OF DIAMONDBACK MOTH IN CANADA

Locations Canada

Dates 01/04/2014 - 31/03/2016

Summary The diamondback moth is a global pest. Canadian farmers often have use chemicals to protect their crops. This is costly and the pest is becoming immune, meaning additional control options are needed. In Europe, Asia and Africa, *Diadromus collaris*, is a major parasitoid of the moth. It has been introduced to several countries or regions and has established as a successful biocontrol. CABI is therefore carrying out life table studies in Europe to determine if its introduction is a viable strategy.

The problem

The diamondback moth, *Plutella xylostella* (Lepidoptera: Plutellidae) attacks a wide variety of Brassica crops globally. It is likely that it was introduced to North America from Europe around 150 years ago where it now occurs throughout the continent wherever brassicas, its host plants, are grown.

In western Canada (Manitoba, Saskatchewan, Alberta and British Columbia) the moth mainly attacks canola (oil seed rape) and mustard crops, whereas in eastern Canada (Ontario, Québec and all Maritime Provinces) it is a pest of vegetable crops of the Brassicaceae family.

Populations regularly infest canola in the Canadian Prairies and this mostly has minor effects on the economy. In some years however, moth populations reach huge outbreak concentrations. In 1995 for example, more than 1.25 million hectares were sprayed with insecticide to control these pest populations which cost an estimated C\$45 to C\$52 million for producers. On an even greater geographic scale, an outbreak occurred in western Canada in 2001, where approximately 1.8 million hectares were treated with insecticide.

In some regions this pest however is now resistant to chemical insecticides. This limits farmers' control options and increases crop losses and production costs. So, additional sustainable control options are needed.

What we are doing

In Europe, Asia and Africa, *Diadromus collaris* is a major parasitoid of diamondback moth pupae. It has previously been introduced successfully in several countries or regions including Australia, Barbados, the Cook Islands, Malaysia and New Zealand. Here it has established and is controlling the moth as a 'classical biocontrol' in a sustainable and targeted way.

Diadromus collaris is not currently present in Canada, so a team from CABI are conducting life table studies in Europe to determine if the introduction of *D. collaris* populations from Europe is a viable strategy.

Results so far

At experimental field sites in Switzerland, diamondback moth pupae are being parasitized by *Diadromus collaris* but this is highly variable and is ranging from 13 – 33%. We will continue life table studies for the next few years so we can further evaluate the impact of the parasitoid on diamondback moth populations.

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