



# RESEARCH FACTS

RESEARCH & TECHNOLOGY DEVELOPMENT FOR THE CANADIAN BEEF INDUSTRY



## Insects for Weed Control

Project Title:

Rearing, Release and Distribution of Insects for Biological Control of Pasture Weeds

Researchers:

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Project  
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3.24

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*Weed: A valueless plant growing wild, especially one that grows on cultivated ground to the exclusion or injury of the desired crop.*  
– Random House Dictionary of the English Language

Other than plants that are poisonous to livestock, individual plants growing on a pasture are rarely a problem. However when large populations of a single species spread over a wide area, choking out and replacing the pasture grasses that provide nutrition to livestock, weeds become an economic issue.

Many of the plants that are considered weeds in Canada were accidentally or misguidedly introduced into North America from other parts of the world. For example, purple loosestrife, which invades wetlands and ditches and out-competes and replaces native plants, was introduced into eastern Canada and the United States in the 1800s for ornamental and medicinal purposes. Bindweed, native to Eurasia, was also sold as an ornamental plant in the 1800s. Other plants, such as bull thistle, were likely introduced by seeds stuck to European settler's belongings.

In their native lands, insect pests evolved with these plants, thus helping keep them in check. When the plants are introduced in parts of the world where their insect pests don't exist, they often spread more rapidly than in their native habitat. As early as the 1920s, scientists began studying insect pests as a means to control the spread of non-native weeds. Introducing natural insect pests is known as biological weed control.

The success of introducing natural pests to control non-native weeds also led to the search for insects to help control native weed species. Biological weed control decreases the use of chemical herbicides and is therefore considered to be better for the environment.

This study assessed the current effectiveness of biological control agents (insects) that had previously been introduced in Canada, focusing on field studies in Nova Scotia. It also updated biological weed control methods, introducing two new insect control agents for tansy ragwort and bull and Canada thistle.

Following up on insect biocontrol introductions carried out in the 1980s and 1990s, surveys of 18 insects on 10 target weed species were carried out. These surveys helped focus efforts on the insects showing the greatest potential to control weeds. The five insects showing the greatest promise were:

- *Hadroplontus litura* (a European weevil) for Canada thistle control
- *Urophora stylata* (a gall fly) for bull thistle control
- *Longitarsus jacobaeae* (a flea beetle) for Tansy ragwort control
- *Deloya guttata* (a leaf beetle) for bindweed control
- *Galerucella calmariensis* (a European beetle) for purple loosestrife control

In addition, two new insects identified by the Biosystematics Centre in Ottawa in 2005 were evaluated. Prior to 2005 these insects were not thought to occur in Nova Scotia. *Longitarsus ganglbaueri*, a flea beetle that feeds on Tansy ragwort, and *Sphaeroderma testaceum*, a flea beetle that feeds on bull thistle and Canada thistle, could have a significant impact on both these weeds at higher populations.

The Nova Scotia-based researchers carrying out these studies are collaborating with scientists at Agriculture and Agri-Food Canada's Biological Control research station in Lethbridge, Alberta. Adapting technology developed at AAFC Lethbridge for field-rearing insect biological control agents resulted in the collection of greater numbers of insects that are better suited for establishment elsewhere in the Maritimes. Continued collaboration with AAFC and other scientists working in the area of biological control across Canada is anticipated.

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