



# Beetles battle bad weeds

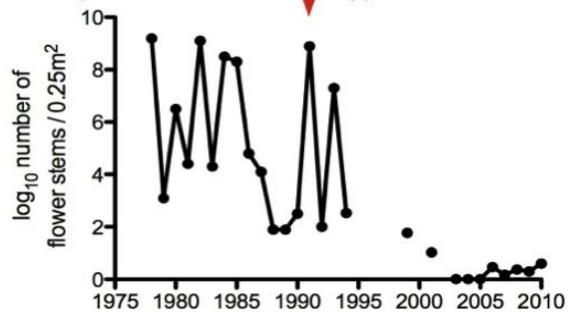
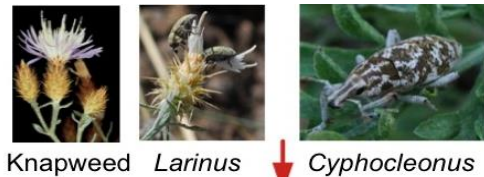
Contributed by Andrea Stephens and Judy Myers

## Background

As humans have moved to all reaches of the earth, plants and animals have accompanied them. Approximately 10% of these introduced species become invasive and detrimental to native plant and animal communities. Diffuse knapweed was introduced from Eurasia to North America with alfalfa seed in the early 1900s. Because it is highly competitive with native grasses, and largely inedible for cattle, it rapidly became a serious grassland weed.

## The Research

One approach to managing invasive weeds is biological control – the introduction of insects from the native habitat of the exotic weed that feed solely on that weed. It is predicted that by increasing the level of insect attack to the target weeds, the vigour and density of the weed will decline. Starting in 1972 twelve species of insects were introduced for biological control of knapweed. With funding from the NSERC Discovery grant program, we have monitored the dramatic decline of knapweed following the establishment of the flower head weevil, *Larinus minutus* and the root weevil, *Cyphocleonus achetes* (see figure). Experiments using caged populations showed that *Larinus* damage is sufficient to reduce knapweed density and these two beetle species independently contribute to the overall damage to the plants. We seek to discover what insects are most effective biological control agents and beetles appear to be a good bet in this regard.



Knapweed density declines after European beetles were introduced. (Myers et al. 2009)

## Why it concerns Canada

Approximately 25% of Canadian plants are introduced species. Many of these are invasive and cost millions of dollars each year in terms of agricultural and environmental damage. Biological control is the only long-term solution for the most detrimental of these species. Determining what types of insects are the most effective and safest biological control agents is of utmost importance to the success of future programs.

## To find out more

-Myers, J. H., C. Jackson, H. Quinn, S. White, and J. S. Cory. 2009. Successful biological control of diffuse knapweed *Centaurea diffusa* in British Columbia Canada. *Biological Control* 50: 66-72.

-Stephens, A. and J.H. Myers 2014. Testing biological control agent compatibility: *Cyphocleonus achates* and *Larinus minutus* on diffuse knapweed. *Biological Control* 70:48-53.

The NSERC Discovery Program: Promoting discovery and fostering innovation in ecology and evolution.

[www.nserc.ca](http://www.nserc.ca), [www.ecoevo.ca](http://www.ecoevo.ca)

