



Biological Control at its Best, Using the *T. julis* Wasp to Control the Cereal Leaf Beetle

Biological control with natural enemies has been the most successful strategy for controlling the cereal leaf beetle in North America for the past 5 decades. The principal natural enemy or biocontrol agent in Western Canada is a very small wasp (3 mm or 1/8 inch), *Tetrastichus julis* (*T. julis*).



The *T. julis* wasp kills the beetle by boring into the beetle larvae and laying around 5 eggs; the wasp eggs hatch in the larvae and devour the beetle. As with the beetle pest, first observed in southern Alberta in 2005, *T. julis* is also gradually spreading across Western Canada. This beneficial wasp only attacks the cereal leaf beetle and does

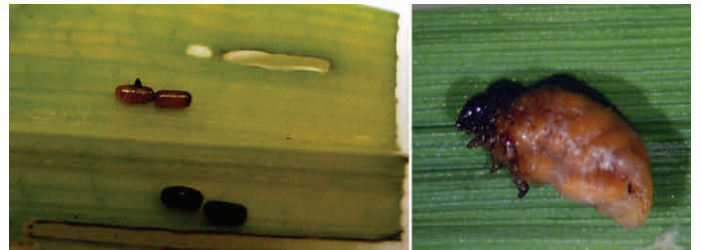
not pose a risk to other insects or humans. In areas where *T. julis* is well established, beetle populations can be reduced between 40 to 90 per cent, and yield losses can be prevented without using insecticides.

Identifying the Cereal Leaf Beetle in Crops

Signs of beetle damage include the complete removal of long strips of tissue (adult damage) or partial removal (larvae) from the upper leaf surface. Removal of leaf tissue often causes the tips of damaged leaves to turn white, giving heavily infested fields a frost-damaged appearance.



To confirm pest presence, begin scouting in the spring when temperatures exceed 10°C for several days and continue until the heads of grain are fully emerged. Avoid sampling during windy or rainy conditions. Nominal thresholds are 1 larva per flag leaf. To estimate larval densities, adjacent stems in 30 cm of crop can be examined in 5 to 10 locations in the field. Areas with luscious, vigorously growing crops will have the highest densities.



Cereal leaf beetle eggs (left) and larvae (right).

Maximizing Effectiveness of Biological Control

Eliminating the use of insecticides or leaving refuge areas untreated can aid the establishments of *T. julis* to reduce beetle populations to avoid yield losses in the long term. Reduced tillage will also enhance *T. julis* survival. Under Agriculture and Agri-Food Canada's (AAFC) Pesticide Risk Reduction Program, the *T. julis* biological control program aims to introduce the small wasp in cereal production areas where the pest is emerging, but the wasp is not yet recorded.

If your scouting program finds the cereal leaf beetle in your field, contact provincial entomologists or Agriculture and Agri-Food Canada entomologists at the Lethbridge Research Centre to assess the need for establishing a *T. julis* biological control program.

For more information, please contact:

Dr. Héctor Cárcamo
Research Scientist, Integrated Pest Management
Agriculture and Agri-Food Canada
Research Centre, Lethbridge, AB
Telephone: 403-317-2247
Email: hector.carcamo@agr.gc.ca

Biological Control at its Best, Using the *T. julis* Wasp to Control the Cereal Leaf Beetle

© Her Majesty the Queen in Right of Canada, represented by the Minister of Agriculture and Agri-Food (2014).

AAFC No. 12218E

Paru également en français sous le titre : La lutte biologique à son meilleur : contrôle du criocère des céréales au moyen de la guêpe *T. julis*.