

Native Southern Ontario wasps are only mildly effective at controlling Tarnished plant bug populations

What is this research about?

The Tarnished plant bug (TPB; scientific name *Lygus lineolaris*) is an agricultural pest native to North America. TPB feeds on and damages many different crops, including vegetables, fruits, greenhouse crops, canola, and legume plants such as alfalfa. In Ontario, 5% of damage to fruit and vegetable crops annually is thought to be due to TPB, resulting in over \$12 million CAD in losses each year. In 1997, for example, 20% of southern Alberta's canola crop, valued at over \$70 million CAD, was lost due to TPB even though the fields had been sprayed with insecticide. Several species of parasitic wasps (called parasitoids) lay their eggs in TPB, which ultimately kills the insects and prevents them from reproducing. While a few of these wasp species are native to North America, some scientists have suggested introducing European species to help control TPB populations. In order to measure the impact of introduced European parasitoids, scientists first need to understand the makeup of the native parasitoid community.

What did the researchers do?

The researchers studied agricultural fields in three regions of southern Ontario, near the cities of London, Niagara, and Guelph, in 1998, 1999, and 2000 (London only). A mix of clean alfalfa fields (less than 10% weeds), "weedy" alfalfa fields, and uncultivated weedy fields were sampled weekly from May to September for insects in the Miridae family (which includes TPB) and their parasitoids. After being caught in sweep nets, each insect was categorized based on species and stage (adult or nymph). Some of the insects were dissected under a microscope to determine the rate of parasitism, while others were raised in the laboratory so that the parasitic wasps could emerge and be identified.

What you need to know:

Six native wasp species were found to parasitize Tarnished plant bugs in southern Ontario alfalfa fields, but overall rates of parasitism were low (below 11%). These results suggest that one or more European parasitoid wasps may help to control Tarnished plant bug numbers.

What did the researchers find?

Of all the Miridae insects collected, 99% were identified as Tarnished plant bugs. Two to three overlapping generations of TPB were found, resulting in large fluctuations in TPB numbers over the course of the summer. Overall rates of parasitism were below 11% and generally consistent from year to year. Both adult and nymph TPB were found to be parasitized, and weedy fields generally had higher levels of parasitism than did weed-free fields. Of the six species of native parasitic wasps identified, *Peristenus pallipes* (in fact a group of difficult to distinguish species) was the most common, especially early in the summer.

How can you use this research?

Farmers can use this research to understand how agricultural practices such as weed removal and cutting alfalfa fields mid-season can affect the parasitic wasps that attack the Tarnished plant bug.

Insect control researchers can use this research to better evaluate the impact of introduced European parasitic wasps on Tarnished plant bug numbers and associated indigenous parasitoid species.

Keywords:

Tarnished plant bug, *Lygus lineolaris*, parasitic wasp, parasitoid, insect control, introduced species

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Article citation:

Broadbent, A.B., Lachance, S., Sears, M.K., & Goulet, H. (2006). Native braconid parasitism of the Tarnished plant bug (Hemiptera: Miridae) in Southern Ontario. *Biocontrol Science and Technology*, 16(7), 687-698.

Cite this work:

University of Guelph, Institute for Community Engaged Scholarship (2013). Native Southern Ontario wasps are only mildly effective at controlling Tarnished plant bug populations. Retrieved from:

<http://hdl.handle.net/10214/6153>

This summary is a project of the Institute for Community Engaged Scholarship (ICES) at the University of Guelph, with project partners: the [Catalyst Centre](#), [SPARK](#) Program at the University of Guelph, and the [Knowledge Mobilization Unit](#) at York University. This project is part of the Pan-Canadian [Research Impact Network](#).

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