



## Developing a Systems Approach to Pest Management on Greenhouse Vegetable Crops: Mirid Predator Selection



### LEAD RESEARCHER

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To find new integrated pest-management strategies to protect greenhouse vegetable crops, a research team is studying two native North American mirid species: *Dicyphus discrepans* and *Dicyphus famelicus*, and one adventive species, *Nesidiocoris tenuis*.

Researchers are focused on breeding genetically improved strains of the native mirid species *Dicyphus famelicus*, which appears to be one of the predominant species of the *Dicyphini* tribe in natural ecosystems across eastern Canada and has a broad genetic diversity. Two other native predator species, *Dicyphus discrepans* and *Dicyphus hesperus*, are being assessed for their comparative biocontrol potential of common greenhouse pests, as well as if they are prone to causing fruit injuries.

Through surveys in Ontario and Quebec, researchers have established and maintained a total of 10 source populations of *Dicyphus famelicus* and one source population for each of *D. discrepans*, *D. hesperus* and *Nesidiocoris tenuis*. Genetic analysis for the 10 populations of *D. discrepans* found at least four distinct DNA sequences suggesting there is substantial genetic variation to support strain phenotypic selection.

From the 10 *D. famelicus* populations, researchers established 12 isofemale lines, which have been assessed through 723 tests for plant or prey feeding preferences. One line was found to be particularly predatory, with

predatory capacity being a heritable trait, which correlates with predator aggressivity.

The research team has started to explain biases in host plant selection for the four native and adventive mirid species, along with the impact of these host plants on population increase rates. They have found all *Dicyphus* species prefer to reproduce on mullein hosts, whereas the adventive *Nesidiocoris tenuis* has a preference for tomato.

Given the prevalence of *N. tenuis* in greenhouses around the world, researchers have focused on finding ways to control the species to reduce crop injury. This includes examining the efficacy of control products, assessing mass trapping approaches and reviewing exclusion screen dimensions. They are conducting trials to find the interactions between all four diverse mirid species and studying the impacts of LED lights and release rates in greenhouse environments.

Over the 2025–26 research season, the team is working to finalize the establishment of isofemale lines for *Dicyphus famelicus* and complete assessments of their feeding behaviour. This will allow researchers to pick the most promising strains to further assess their biological control potential on greenhouse crops.

### KEY TAKEAWAYS:

- Genetic analysis for the 10 populations of *D. discrepans* found at least four distinct DNA sequences, suggesting there is genetic diversity for strain phenotypic selection.
- Researchers have found all *Dicyphus* species prefer to reproduce on mullein hosts, whereas the adventive *Nesidiocoris tenuis* has a preference for tomato.



A female *D. discrepans*. Photo: Carly Demers



A female *D. famelicus*. Photo: Carly Demers

