# 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 tenui*s.

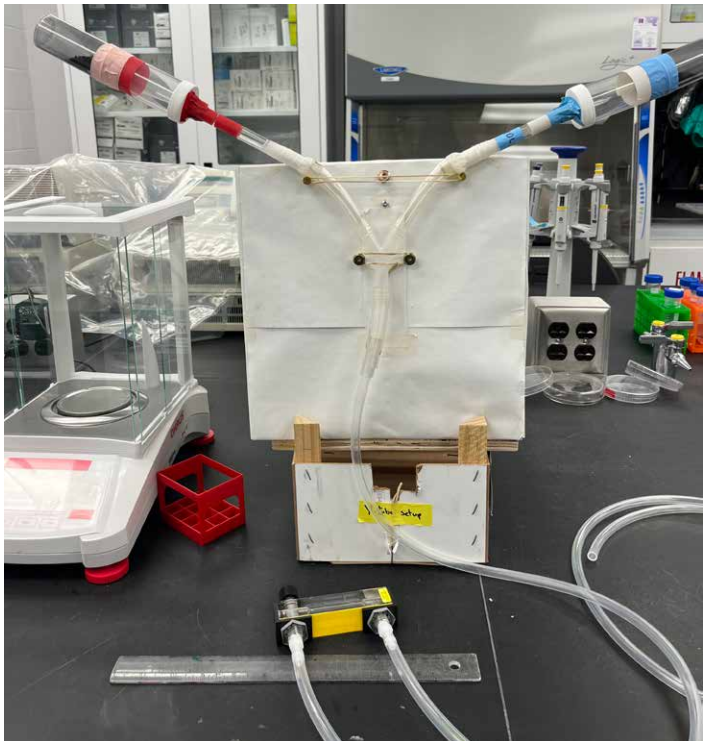
Researchers have been focused on breeding genetically improved strains of the native mirid species *Diciphus famelicus*, which appears to be one of the predominant species of the *Dicyphini* tribe in natural ecosystems across eastern Canada and has a broad genetic diversity. Two other native predator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

In 2025, the research team characterized the genetic variation of *D. famelicus* predators from three new sources collected in 2024. However, given these didn't represent new genetics, the researchers have proceeded with continued work to characterize existing isolines.

Over the past year, the researchers completed assessment of oviposition preference of predators on tomato, cucumber and sesame (*Dicyphus hesperus* and *N. tenuis*). The research team is assessing the potential of predation among native mirids and *N. tenuis* along with the effects of a multi-predator environment on plant distribution preferences.

Tests this winter examining intraguild interactions among four mirid species showed low overall levels of intraguild predation, with two significant cases: *Dicyphus famelicus* consumed 18 per cent of *D. hesperus* nymphs, and *D. hesperus* consumed 13 per cent of *Nesidiocoris tenuis* nymphs. These results suggest multiple mirid species can likely be released together without compromising biological control, but native species are unlikely to suppress the exotic *N. tenuis* through competition.

A greenhouse trial of mirid host preferences. Photo: Isabella Nardone



A mirid prey attraction assay. Photo: Isabella Nardone

Greenhouse trials in summer 2025 confirmed low intraguild predation between species and provided insight into plant and oviposition preferences. Both *D. hesperus* and *D. famelicus* adults strongly preferred mullein over tomato, while *N. tenuis* used both plants more evenly. Vertical positioning on tomato plants showed little pattern except for *D. famelicus*, which preferred the middle and lower sections when alone.

Oviposition patterns varied by species. *D. hesperus* consistently preferred mullein, *D. famelicus* showed no plant preference, and *N. tenuis* typically preferred tomato – except when paired with *D. famelicus*, then it shifted to mullein. Vertical oviposition on tomato was generally uniform, aside from *D. famelicus*, which favoured the middle of the plant. These details on mirid species distribution on different host plants can help researchers understand how likely species are to have either positive or negative interactions.

The research team is planning to acquire information on mirid species prey preferences through olfactory preference trials. These trials will provide essential information for each mirid species related to their ability to locate pests through volatile and olfactory cues.

## KEY TAKEAWAYS:

- The research team characterized the genetic variation of *D. famelicus* predators from three new sources, but as they didn't represent new genetics, the researchers have proceeded with continued work to characterize existing isolines.
- Researchers have found that multiple mirid species can likely be released together without compromising biological control, but native species are unlikely to suppress the exotic *N. tenuis* through competition.
- Vertical positioning on tomato plants showed little pattern except for *D. famelicus*, which preferred the middle and lower sections when alone.