



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



LEAD RESEARCHER

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Conventional pesticide use has climbed over the past 70 years, causing increased pest resistance to numerous chemical pesticide classes. To find new integrated pest-management strategies to protect greenhouse vegetable crops, a research team is studying three native North American mirid species: *D. discrepans*, *D. famelicus*, and *Macrolophus tenuicornis*. This builds upon a previous FVGC project where multiple new native predators with potential as commercial biocontrol agents were surveyed and collected.

The team is now conducting trials to compare the biological characteristics of select strains of these mirid species and rate their ability to manage greenhouse pests such as whitefly, spider mites and aphids. Through applying a selection approach, mirid strains can be developed to be tested on different vegetable crops to identify optimal environmental conditions needed for applying these predators successfully in Canadian commercial greenhouse settings.

To start, the team will develop novel open-rearing systems where the best bug strains and species will be put into optimized host plants. By doing this, growers should be provided with longer-term biological pest controls than are currently available. The research team expects that by creating open-rearing frameworks, growers will be able to more effectively apply a preventative and durable approach to fight back against pests. This will maximize biocontrol efficiency while lessening the need for the application of conventional agents and reducing crop losses from diverse greenhouse arthropod pests.

KEY TAKEAWAYS:

- Add to the development of a complete systems approach for applying and commercializing new native biocontrol organisms.
- Establish rates and schedules for introducing native biocontrol agents onto open-rearing systems.
- Develop best practices for applying open-rearing systems by identifying preferred host plants, supplemental foods and lights.
- Maximize the spreading of information about reducing crop losses and increasing returns to encourage growers to adopt new agents and open-rearing strategies in greenhouse vegetable crops.
- Aim to reduce losses from invasive species by applying a selective breeding and open-rearing approach to boost predator performance and persistence on crops.
- During the 2023–24 season significant progress was made in collecting mirids, with at least three species gathered, including *Dicyphus famelicus*, *Dicyphus discrepans* and a third mirid, *Nesidiocoris tenui*.
- Alternate species, including *D. discrepans* and *Macrolophus sp.*, will be collected during 2024–25 to include in surveys of alternate host plants.

