



Field Vegetable Research Activities

The field vegetable sector has two research activities with the Canadian AgriScience Cluster for Horticulture Cluster 4. These two activities are focused on making soil more resilient and protecting vegetable crops against pests.

THE CLUSTER 4 FIELD VEGETABLE RESEARCH ACTIVITIES ARE:

ACTIVITY 7

Increasing field vegetable yield and resilience to abiotic and biotic stresses through soil microbial engineering

LEAD RESEARCHER – Herve Van Der Heyden, research scientist with Agriculture and Agri-Food Canada Saint-Jean-sur-Richelieu Research and Development Centre

ACTIVITY 8

Reduce risk strategies for cabbage maggot control

LEAD RESEARCHER – Renee Priya Prasad, associate professor and department head for agriculture at the University of the Fraser Valley

This project is generously funded through the Canadian AgriScience Cluster for Horticulture 4, in cooperation with Agriculture and Agri-Food Canada's AgriScience Program, a Sustainable Canadian Agricultural Partnership initiative, the Fruit and Vegetable Growers of Canada (FVGC), and industry contributors.



Increasing Field Vegetable Yield and Resilience to Abiotic and Biotic Stresses Through Soil Microbial Engineering

LEAD RESEARCHER

Herve Van Der Heyden

Research scientist with Agriculture and Agri-Food Canada
Saint-Jean-sur-Richelieu Research and Development Centre

This research activity is working to develop, validate and implement bacterial inoculum to improve field vegetable yield and plant diseases while reducing fertilizer and pesticide inputs. Two proprietary bacterial strains, *Pseudomonas sp.* and *Bacillus sp.*, from Agriculture and Agri-Food Canada (AAFC) have shown plant growth promotion and increased plant drought resistance capabilities. These bacterial strains will be used to fast-track microbial consortia development, field evaluation and validation for the research activity.

The research team is currently planning lab and greenhouse experiments. Only small-scale field experiments have been done to date. Field experiments were conducted to test the effect of the bacterial strains on lettuce growth in 2024. The bacterial strains were found to increase plant growth – specifically in the early stages of lettuce growth.

Researchers also found that among the 1,200 bacterial strains extracted from soil samples collected from organic fields in southern Quebec and at AAFC experimental farms, 45 strains are showing promising plant pathogen inhibitory potential (biocontrol). The strains have been tested against four plant pathogenic *Pythium* species and *Sclerotinia sclerotiorum*. Thirty-three of these strains showed deterrence effects and were further tested against the same five plant pathogens in vitro. Eighteen of these *Pseudomonas* strains have been shown to be effective against *Pythium* species, while 10 strains had an inhibitory effect on *S. sclerotiorum*.

KEY TAKEAWAYS:

- Two proprietary bacterial strains from AAFC have shown plant growth promotion and increased plant drought resistance capabilities. These are being used to fast-track microbial consortia development, field evaluation, and validation.
- Tests of the bacterial strains on lettuce growth found that the strains increased plant growth, specifically in the early stages of lettuce growth.
- Researchers have found that among the 1,200 bacterial strains extracted from soil samples collected, 45 strains are showing promising inhibitory potential.





Reduce Risk Strategies for Cabbage Maggot Control



LEAD RESEARCHER

Renee Priya Prasad
Associate professor and
department head for agriculture
at the University of the Fraser Valley

Crucifers (crops in the cabbage family) provide numerous opportunities for Canadian vegetable growers but are under attack by cabbage root maggots. In this research activity, the team is working to find new management tools – mainly insecticides – and strategies for how to use those insecticides with non-insecticide tools, so growers will see decreased crop losses from cabbage root maggot.

Over the winter, the research team at Agriculture and Agri-Food Canada Agassiz Research and Development Centre has been establishing a colony of *D. radicum* (cabbage root flies). Efficacy tests of different pesticides that are being evaluated in field trials will be used on the colony. The establishment of a *D. radicum* colony is challenging work. Last fall a colony was set up but crashed, requiring the research team to start over.

The research team is planning to start field trials in April depending on the weather.

KEY TAKEAWAYS:

- Researchers have been working to establishing a colony of *D. radicum*. This is challenging work as last fall a colony was set up but crashed, requiring the research team to start over.
- Efficacy tests of different pesticides, currently being evaluated in field trials, will be used on the *D. radicum* colony.
- The research team is planning to start field trials in April depending on the weather.



On June 19, 2024 a field session was held in Abbotsford, B.C. to examine the field plots of the cabbage root maggot insecticide efficacy trials. Photo: Thomas Johnston



Close up of cabbage maggots on Brussels sprout roots.

Photo: Thomas Johnston

