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.

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

LEAD RESEARCHER

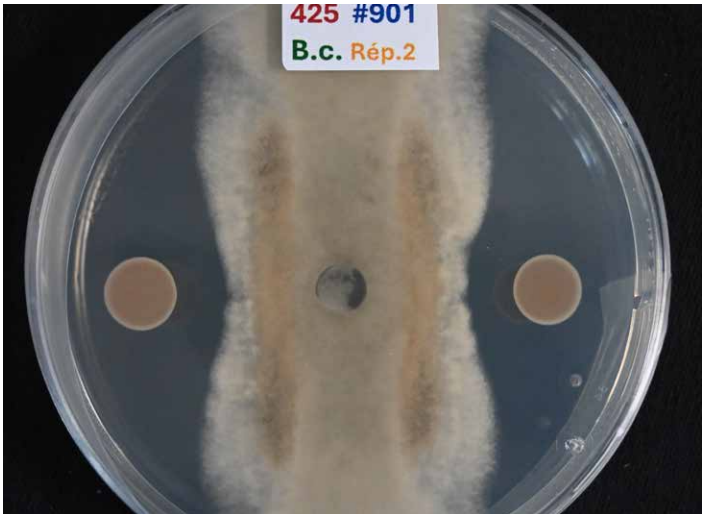
Herve Van Der Heyden
Research scientist with Agriculture and Agri-Food Canada
Saint-Jean-sur-Richelieu Research and Development Centre

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. The research team has completed one year of trials under controlled conditions and two years of field trials under experimental conditions on lettuce and broccoli crops for growth promoters. These trials will proceed to commercial condition trials with growers over the next two years.

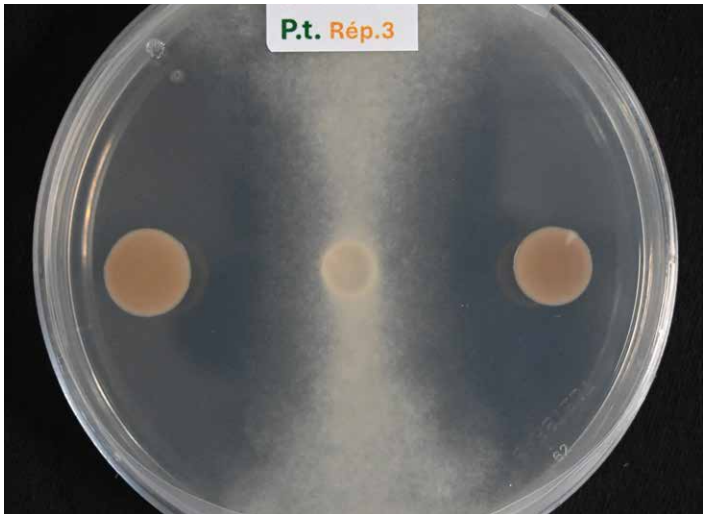
For biological control agents, researchers have begun screening a large collection of bacterial strains from the genus *Pseudomonas* to determine its biocontrol potential against a panel of phytopathogenic species including *Pythium spp.*, *Botrytis spp.*, *Rhizoctonia solani*, *Fusarium oxysporum* and many others.

Researchers have identified two bacteria strains with growth promotion potential for lettuce. Pre-transplant inoculation of the lettuce increased the foliar biomass of treated lettuce for a period of two to three weeks, allowing the plant to be more resilient during critical early growth stages. One of these two strains has been submitted to the invention disclosure process so it can be licensed to industry.

A field trial of lettuce in Sainte-Clotilde Experimental Farm in Quebec. Photo: Melanie Cadieux



The bacterial strain *Pythium*. Photo: Melanie Cadieux



The bacterial strain *Botrytis*. Photo: Melanie Cadieux

On the biocontrol side, researchers are still screening the bacterial strain collection. However, they've already identified candidate strains capable of inhibiting the growth of several pathogens in vitro. Furthermore, some strains can inhibit the in vitro growth of pathogens for more than seven days.

KEY TAKEAWAYS:

- Researchers have identified two bacteria strains with growth promotion potential for lettuce. The bacteria increased the foliar biomass of treated lettuce for a period of two to three weeks.
- One of the two bacteria strains has been submitted to the invention disclosure process so it can be licensed to industry.
- Researchers have identified candidate strains capable of inhibiting the growth of several pathogens in vitro. Some strains can inhibit the in vitro growth of pathogens for more than seven days.

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 has been working to find new management tools to allow growers to see decreased crop losses from cabbage root maggot.

The research team has found the tools tested provide reduction in root maggot damage on roots for three weeks in earlier plantings of brassica crops. As plantings go later in the season, pest pressure increases with no reductions in damage compared to the untreated control.

Field samples are being collected to see how many parasitoids of *Delia radicum* are present in the different treatments.

Preliminary data is suggesting that the levels of parasitism are similar in treatment plots and control plots. This is good news for producers as it's beneficial to have the natural enemies protected for control of subsequent generations of a pest.

For the 2026 growing season, the research team is planning to repeat chemical control trials and considering a trial in another part of Canada. For the British Columbia trials this will be the third year of data.

KEY TAKEAWAYS:

- Tools tested provide reduction in root maggot damage on roots for three weeks in earlier plantings of brassica crops.
  - With later season plantings, pest pressure increases with no reductions in damage compared to the untreated control.
- Preliminary data is showing that the levels of parasitism are similar in treatment plots and control plots.

Cabbage root maggot field plot trials at Abbotsford, B.C. Photo: Toban Dyck

A test strip with cabbage root maggots on it. Photo: Toban Dyck

Cabbage plant plots at the Agriculture and Agri-Food Canada Agassiz Research and Development Centre. Photo: Toban Dyck