



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. The research team has developed an automated and standardized protocol to quantify growth inhibition on artificial media. They have completed the screening of their bacterial strains collection against many fungal and oomycetes pathogens. Preliminary assays to test the bacterial strains against plant pathogens in-planta have begun.

The research team has found biocontrol potential after finishing screening of a large collection of bacterial strains. Three highly promising bacterial strains were selected and tested in-vitro against 16 economically important plant pathogens. It was discovered the bacteria strain B21-024 significantly increased the yield of lettuce in the early stages of plant growth.

Field trials in Agassiz, B.C. are testing three plant growth promoting rhizobacteria (PGPR) strains in lettuce and broccoli. Field trials were started in Québec in collaboration with lettuce growers to benchmark three PGPR strains in lettuce production. PGPRs and biological control agents can reduce the risks associated with pesticide use.

The research team is planning to complete a first cycle of in-planta trials to assess the performance of their top three bacterial strains against onion pathogens (Stemphylium and leaf blight), lettuce pathogens (Pythium, Rhizoctonia and Sclerotinia) and pepper pathogens (Phytophthora capsici).

KEY TAKEAWAYS:

- The bacteria strain B21-024 can significantly increase the yield of lettuce in the early stages of plant growth.
- Field trials are happening in B.C. and Quebec to test three PGPR strains. PGPRs and biological

control agents can reduce the risks associated with pesticide use.

- The research team is planning to complete a first cycle of in-planta trials to assess the performance of their top three bacterial strains against onion, lettuce and



The bacterial strain Pythium.



The bacterial strain Botrytis.



A field trial of lettuce in Sainte-Clotilde Experimental Farm in Quebec.

Photos: Melanie Cadieux





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.

This growing season has seen the British Columbia team complete a transplant trial with broccoli and a direct seed rutabaga trial. Two more trials are under way. The crops were transplanted from the University of the Fraser Valley greenhouse.

The research team is assessing transplant tray treatments for products Cimegra and Equento. Cimegra has performed well in trials as a post-transplant drench. Growers are interested in doing Cimegra applications to transplant trays. Equento is newly registered for wireworms, but the company is interested in other possible registrations including cabbage maggots.

A total of five field trials were conducted, although the first direct seed trial was abandoned due to poor germination. The remaining four trials were successful with the fourth and final trial ending in mid-August.

There are two field trials remaining to collect data on. The researchers also plan to survey for biological control. There are plans to organize field trials in Nova Scotia for the 2027 field season.

KEY TAKEAWAYS:

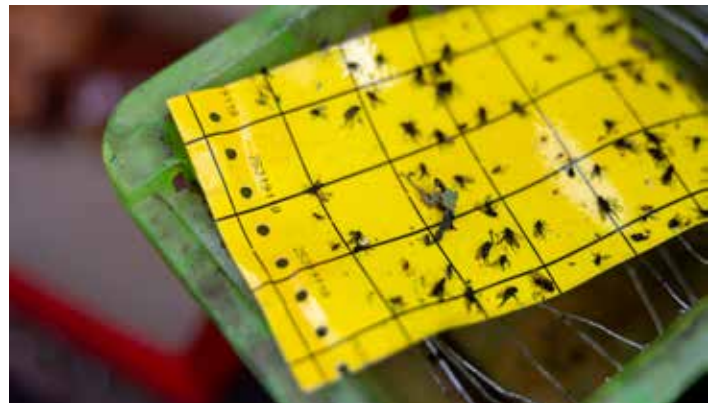
- Cimegra has performed well in trials as a post-transplant drench. Growers are interested in doing Cimegra applications to transplant trays.
- Equento is newly registered for wireworms, but the company is interested in other possible registrations including cabbage maggots.
- Two trials have been successful this year, with the earliest planting of rutabaga abandoned due to poor germination.
- There are plans to organize field trials in Nova Scotia for the 2027 field season.



Cabbage root maggot field plot trials at Abbotsford, B.C.



Cabbage plant plots at Agriculture and Agri-Food Canada Agassiz Research and Development Centre.



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

