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

LEAD RESEARCHER

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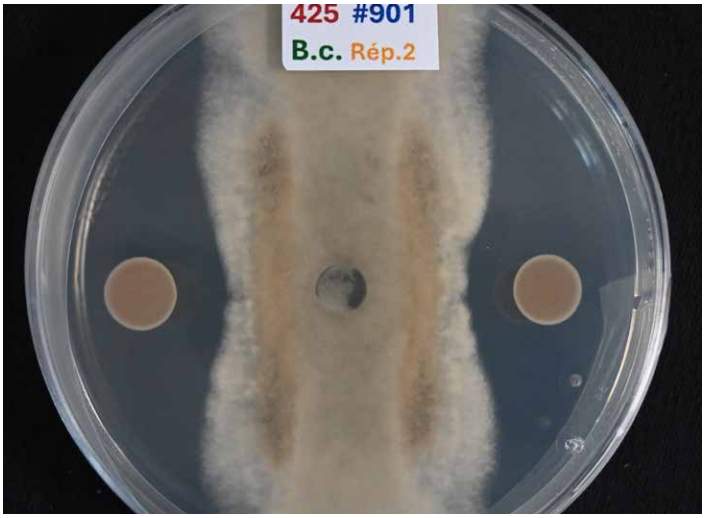
This research activity is working to develop, validate and implement bacterial inoculum to improve field vegetable yield and plant diseases while reducing fertilizer and pesticide inputs. The research team has completed one year of trials under controlled conditions and two years of field trials under 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.

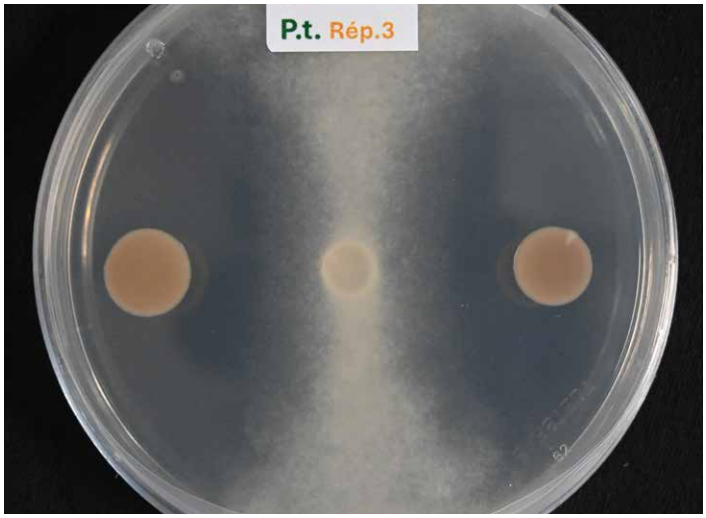
For biological control agents, researchers have begun screening a large collection of bacterial strains from the genus *Pseudomonas* to determine its biocontrol potential against a panel of phytopathogenic species including *Pythium spp.*, *Botrytis spp.*, *Rhizoctonia solani*, *Fusarium oxysporum* and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