



Potato Research Activities

The potato sector has three research activities with the Canadian AgriScience Cluster for Horticulture Cluster 4. These three activities are focused on sustainability, soil health and finding new potato varieties for growers across Canada.

THE CLUSTER 4 POTATO RESEARCH ACTIVITIES ARE:

ACTIVITY 11

National potato variety evaluation for sustainability, resilience and climate change

LEAD RESEARCHERS – Erica Fava, national potato variety trial coordinator and industry liaison; Jen McFarlane, soft fruits IPM coordinator and research coordinator with E.S. Cropconsult; and Katerina Jordan, associate professor at the University of Guelph

ACTIVITY 12

Regenerative and sustainable agriculture for climate change adaptation and carbon sequestration: rebuilding soil health and increasing crop productivity of Canadian potato production systems

LEAD RESEARCHER – Claudia Goyer, research scientist with Agriculture and Agri-Food Canada at the Fredericton Research and Development Centre

ACTIVITY 13

Positioning Canada's potato industry for improved sustainable production

LEAD RESEARCHER – Mario Tenuta, senior industrial research chair in 4R nutrient management and professor of soil ecology at the University of Manitoba

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.



National Potato Variety Evaluation for Sustainability, Resilience and Climate Change

LEAD RESEARCHERS

Erica Fava

National potato variety trial coordinator and industry liaison

Jen McFarlane

Soft fruits IPM coordinator and research coordinator with E.S. Cropconsult

Katerina Jordan

Associate professor at the University of Guelph

The national potato variety evaluation is working to boost profits and sustainability for the Canadian potato industry by finding new potato selections with improved productivity, disease resistance and climate resilience. New selections are being compared to currently grown potato varieties across the major potato production areas of Canada.

The Ontario trials have identified new promising potato varieties. F180085-04 is a standout early to mid chip line with high yield and gravity and low sugar levels at harvest. It reduces the likelihood of processors rejecting a crop due to high sugar levels. AG1540 was the highest-yielding late-maturing fresh market line in trials. VF180073-13 is highly resilient, ranking as a top yielder in both the standard and heat-stress trials. This variety allows growers to better manage the risks associated with increasingly frequent summer heatwaves. VF19006-002, AG1601.05, and Kingsman were found to be the strongest dual-purpose varieties for boiling and baking in trials.

The 2025 Ontario growing season trials were harvested and evaluated in the fall, with the research activity currently in the active storage testing phase for the 2025–2026 long-term commercial storage trials. The research team plans to share the comprehensive results of the 2025–2026 storage trials in December this year.

For the Agriculture and Agri-Food Canada (AAFC) trials, the team conducted trials in the major potato production regions of Canada in 2025. Agronomic and yield data were collected at each site as well as the daily weather data and field records. Quality assessments, of fry and chip colour, and boil and bake assessments, have started and will continue through



Potato trials during the 2025 growing season at Agriculture and Agri-Food Canada Harrington Research Farm on Prince Edward Island.

Photo: Scott Anderson

storage. The data from each site is currently being compiled and analyzed.

The AAFC team expects the 2025 data will allow them to evaluate the selections for drought tolerance as the eastern sites were rainfed and had suffered from a major drought during the tuber bulking period. The overall yields were much lower at these sites, which will allow the team to identify selections that outproduced the standard varieties grown in the trials.





KEY TAKEAWAYS:

- F180085-04 is a standout early to mid chip line with high yield and gravity and low sugar levels at harvest. It reduces the likelihood of processors rejecting a crop due to high sugar levels.
- AG1540 is the highest-yielding late-maturing fresh market line.
- VF180073-13 is highly resilient, ranking as a top yielder in both the standard and heat-stress trials. This variety allows growers to better manage the risks associated with increasingly frequent summer heatwaves.
- VF19006-002, AG1601.05, and Kingsman were found to have the strongest dual-purpose varieties for boiling and baking.
- The AAFC team expects the 2025 data will allow them to evaluate the selections for drought tolerance as the eastern sites were rainfed and suffered from a major drought during the tuber bulking period.

A potato trial plot on Prince Edward Island on Sept. 4, 2025. The plants were not been top killed, but because of the drought some look like they had been. Photo: Andrea Bizeau





Regenerative and Sustainable Agriculture for Climate Change Adaptation and Carbon Sequestration: Rebuilding Soil Health and Increasing Crop Productivity of Canadian Potato Production Systems



LEAD RESEARCHER

Claudia Goyer

Research scientist with Agriculture and Agri-Food Canada at the Fredericton Research and Development Centre

Regenerative and sustainable agricultural practices (RSAPs) are being studied in several locations across Canada to mitigate soil degradation and loss of biodiversity caused by intensive farming practices and ensure long-term viability of potato farms.

On flagship farms on Prince Edward Island, an increase in plant diversity in the rotation phase was tested this past year. Researchers found that direct seeding of an alfalfa-grass treatment showed greater biomass and soil quality improvements than compared to a conventional practice and alfalfa-grass under seeded in the preceding summer. The direct seeded alfalfa-grass treatment likely provided a nitrogen credit for the 2026 potato crop. The researchers are planning to test reduced nitrogen fertilization rates alongside standard practices for the 2026 potato crop.

At a flagship farm in New Brunswick, researchers have found that plant mixes of timothy, verticillium resistant alfalfa and ryegrass, and of ryegrass, pearl millet and sorghum Sudan grass don't favour nematode growth when compared to a timothy, red clover and ryegrass plant mix. There's a greater abundance of nematodes in soils with low seeding rates of ryegrass, pearl millet, Sudan sorghum grass mix than compared to a high seeding rate of the same mix. This could indicate that a lower seeding rate of the plant mixes is not effective in reducing the growth of nematodes.

The research team has used satellite images in New Brunswick to develop a simple approach to determine field management zones. These images provide Normalized Difference Vegetation Index (NDVI) that shows how green and healthy plants are. By analyzing NDVI images taken over several years, researchers can identify patterns in crop growth. They tested this method on 17 potato fields at the McCain Farm of the Future in Florenceville-Bristol, N.B., using data



(L-R) Tyler Nugent and Thomas Foster harvesting potatoes at the McCain Farm of the Future in Florenceville-Bristol, N.B.

Photo: Claudia Goyer



Sean Whitney bagging potatoes at the McCain Farm of the Future in Florenceville-Bristol, N.B. Photo: Claudia Goyer





from 2015 to 2023. From 230 satellite images, the researchers created maps dividing each field into three management zones based on their potential for crop production. They compared these zones with actual potato yields and soil tests from 2023. It was found that areas with higher potential had better yields and more nutrients including organic carbon and nitrogen.

KEY TAKEAWAYS:

- A direct seeded alfalfa-grass treatment has shown greater biomass and soil quality improvements compared to the grower standard practice, likely providing a nitrogen credit for potatoes.
- Plant mixes of timothy, verticillium resistant alfalfa and ryegrass, and ryegrass, pearl millet, and Sudan sorghum grass reduced nematode abundance when compared to grower standard practice.
- NDVI maps in New Brunswick showed that high NDVI management zones of the fields were linked to greater crop yield and nutrients.



Master of Science student Taylor Austin working in the lab at the Agriculture and Agri-Food Canada Fredericton Research and Development Centre. Photo: Claudia Goyer





Positioning Canada's Potato Industry for Improved Sustainable Production

LEAD RESEARCHER

Mario Tenuta

Senior industrial research chair in 4R nutrient management and professor of soil ecology at the University of Manitoba

This research activity is studying ways to improve nitrogen use efficiency in Canadian processing and table potato production. The research team is working to determine the environmental and agronomic performance indicators for fresh and processing potatoes in Canada. Emissions efficiency and nitrogen management practices on potato farms across the country are being tested.

Trials are taking place in Alberta, Manitoba, New Brunswick and Prince Edward Island. Researchers added different rates of nitrogen fertilizer to standard varieties of table and processing potatoes and newer suspected higher nitrogen use efficient varieties.

Field activities wrapped up in early October with harvest and post-harvest soil sampling. Since then, the research team has been processing samples.

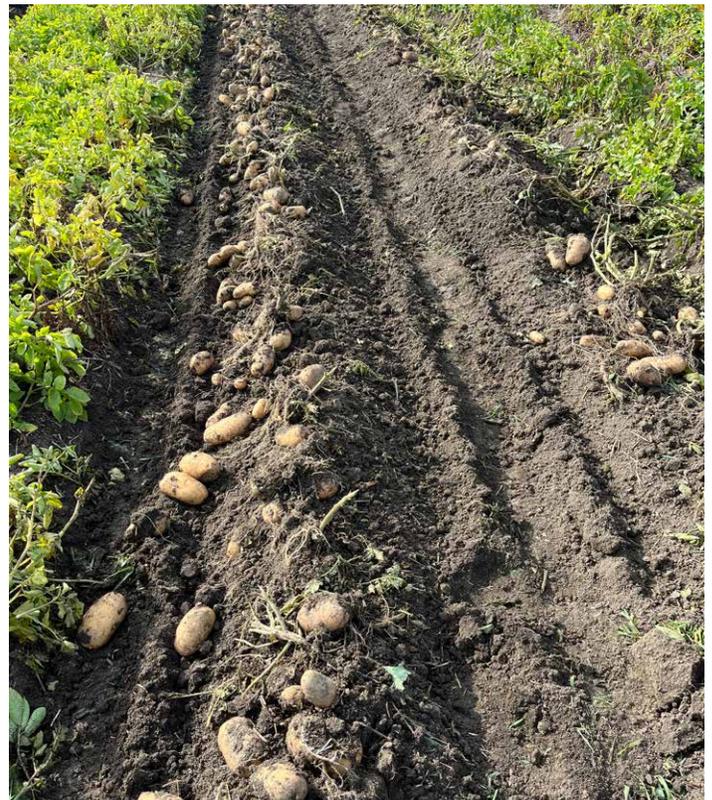
Research to date is showing the test cultivars have superior nitrogen use efficiency than the standard cultivars. Also, nitrification inhibitors are reducing N₂O emissions, this depends on site and weather conditions during the growing season.

KEY TAKEAWAYS:

- Test cultivars are being found to have superior nitrogen use efficiency than the standard cultivars.
- Nitrification inhibitors are reducing N₂O emissions, but this depends on site and weather conditions during the growing season.



Dark Red Norland potatoes ready to be weighed after harvest on Sept. 2, 2025. Photo: Chris Hoffmann



A Dakota Russet potato trial ready for harvest on Sept. 15, 2025.

Photo: Chris Hoffmann

