

# Canadian Agri-Science Cluster for Horticulture 3



## Update to Industry

### 2020-21 – Semi-Annual

**Activity title:**

Canadian Potato Variety Evaluation

**Name of Lead Researcher:**

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**Names of Collaborators and Institutions:**

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**Activity Objectives:**

To evaluate new potato selections from the AAFC National Potato Breeding Program across the country to determine the adaptability of the lines to different climatic regions.

To evaluate the local adaptability of French fry, fresh market and chip potato varieties and promising selections from a wide range of public and private sources.

**Research Progress to Date:**

AAFC National Potato Variety Trials

The objective of the trials program is to evaluate new early selection potato clones from AAFC's National Potato Breeding Program across the country to determine the adaptability of the lines to different climatic regions. Selections are evaluated in national field trialing year 1 (Tier I) year 2 (Tier II) in this program. Identified promising selections may be offered for further field evaluation in replicated trials under the Provincial Variety Evaluation Trials program.

Tier I Trials (Year 1 of national trialing)

- The New Brunswick trial sites were not planted in 2020 due to COVID-19 restrictions. Trials did proceed at seven locations across Canada: Charlottetown PE, Sainte-Croix QC, Elora ON, Winkler MB, Carberry MB, Outlook SK and Brooks AB (two demonstration sites were planted in AB and BC).
- Twenty-one selections and 8 check varieties were evaluated at each location, including fresh market, chipping and French fry types. Trials were planted, grown and harvested following commercial production practices common in the local area.

Tier II (Year 2 of national trialing)

- Two selections were advanced and evaluated against 8 check varieties in trials with 2 replicates at all locations.

Early Selection Evaluation

- In addition, very early selections identified at AAFC New Brunswick from Field Year 3 and 4 of the AAFC National Potato Breeding Program were grown at select trial sites to gain information about how the selections would perform at sites outside of New Brunswick and to gain feedback from industry on the selections earlier in the pipeline.
- For the Field Year 3 selections, fresh market and French fry selections were evaluated in Manitoba, whereas chip and fresh market selections were evaluated in Ontario.

- For the Field Year 4 selections, all three market types were grown in Manitoba and fresh market and chip selections were grown in Ontario.

#### Provincial Variety Evaluation Trials

The provincial variety evaluation trials are designed to allow the local evaluation of adaptability of promising new varieties or selections across Canada. Selections from the AAFC National Potato Breeding Program in national field trialing year-5 or later may be evaluated. Varieties or selections from private breeding programs, university breeding programs in the US, Canadian agents, and other variety developers may be included in the provincial trials at the determination of the funding provincial organizations.

- Field trials continued in 2020 at most locations as planned, although the size of the trials were reduced at a few locations due to COVID-19 restrictions.
- Varieties and selections (fresh market, chipping and French fry types) were grown at seven sites across Canada and compared to standard varieties for agronomic and quality characteristics.
- Replicated field trials were conducted in Prince Edward Island (Harrington), Quebec (Ste-Croix; L'Assomption), Ontario (Elora), Manitoba (Winkler – fresh market), Alberta (Brooks) and British Columbia (East Delta).
- Grower field days were cancelled at many locations or held with reduced participants or held virtually due COVID-19 restrictions.
- The number and types of varieties and selections evaluated at each location are available in the Summary Table of the Provincial Evaluation Trials at the end of this report.

#### **Extension Activities (presentations to growers, articles, poster presentations, etc.):**

Extension activities continued in a modified format through virtual meetings and presentations to growers, or where possible in-person grower field days with restricted attendance.

#### **COVID-19 Related Challenges:**

Cancellation of planting of AAFC National Potato Variety trial at New Brunswick locations due to health restrictions. In addition, there was some downsizing of trial size at some locations. Many grower field days were cancelled or restricted in attendance or moved to virtual format.

#### **Key Message(s):**

- The national potato variety evaluation trials are important for industry stakeholders to observe selections and review regional data for promising new varieties. The value-chain nature of the trial and efforts to provide data as required for each stakeholder will result in greater uptake of new varieties for the Canadian potato industry.
- The AAFC National Potato Breeding Program is focusing its efforts to work in unison with all stakeholders to increase the value of the program to the Canadian Potato Industry and Canada. For French fry selections, three requests were made for F14021 and five requests for VF14016 by industry partners, based on their success over multiple locations and/or their own experience trialing the material in 2020. The Fresh Market selection, F14119, was requested by 8 industry partners and the Tier 2 Chip selection, FV16324-08 was requested by 5 industry partners for further trialing.
- The provincial variety evaluation trials provide the opportunity to determine the local adaptability of promising new selections and varieties from a range of private and public sources and the suitability for adoption in the regions across Canada.

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### Summary of Provincial Variety Evaluation Trials - 2020

Trial Location	Trial Manager	Number of Lines Evaluated and Type	Suppliers of Varieties Evaluated	Grower Knowledge Transfer Activities	COVID-19 Impact
East Delta BC	E.S. Cropconsult Ltd.	43 varieties planted in the replicated trial; 27 AAFC varieties evaluated; 70 varieties in hill demo plots	Private industry and the AAFC national breeding program.	Grower field day August 19 (50 attendees).	Scheduled limited access to field trials on grower field day. Objectives for 2020 trial met.
Brooks AB	Lethbridge College University of Lethbridge	57 varieties (French fry, chipping and fresh market) were evaluated including 31 AAFC varieties.	Private industry and the AAFC national breeding program.	Virtual Field Day, August 21, 2019; potato were dug, photographs were taken and compiled to share with industry.	There were challenges encountered as a result of Covid-19 such as delay in seed supply and other logistics. Virtual rather than in-person field day.
Winkler MB	Peak of the Market	42 varieties in replicated trial (fresh market red skinned/white flesh; yellow; white; russet; creamer)	Private breeders, Canadian agents, and variety developers.	Grower field day August 13.	Restricted attendance at field day. Fall grower meeting cancelled and will be moved to virtual meeting in 2021. Objectives for 2020 trial met.
Elora ON	University of Guelph	<p><u>National Trial:</u> 35 elite breeding lines plus standards were grown in replicated plots (fresh market, chip processing, French fry processing, creamers and specialty/health markets).</p> <p><u>Chip and Table Stock Trials:</u> 15 each of promising chip and table stock lines were obtained through collaborations with other breeding programs including the University of Wisconsin and Michigan State University and grown in replicated trials.</p> <p><u>Early Generation Selection of Breeding Lines:</u> Approximately 100 selections representing all market sectors were grown in small plots (i.e. 4 hills and 8 hills). Two early maturing chip lines were identified and will be targeted for advance trial in 2021.</p> <p><u>On-Farm Trials (non-replicated):</u> Promising new varieties and advanced selections from breeding programs</p>	AAFC breeding program. Chipping and fresh market lines in collaboration with other breeding programs.	Presentations on research highlights to five district meetings during November 2020 and to the Ontario Potato Board Annual Meeting in December.	There was a reduction in the size of the trials. French fry types were omitted this year due to unavailability of AAFC lines, but instead we were able to focus on chip and fresh market lines. The early maturing chip trial in Leamington was not planted due to the lockdown in March and April. The annual field day and tours of the Elora plots were cancelled.

		were evaluated in commercial fields in the Alliston and Shelburne areas (scab tolerance).			
Ste-Croix QC L'Assomption QC	Progest2001 Inc.	Trials were conducted at two sites with 3 replicates. A total of 42 lines or new varieties and 12 known/check varieties were grown in one of 5 sub-trials according to type; white round (10), yellow flesh (10), long (13), red skinned (15), specialty (6).	AAFC national breeding program (8), Quebec Potato Research Consortium (16), Progest2001 (9), other national and international programs (9).		Trials proceeded as planned.
Harrington, PE	PEI Potato Board, AAFC	Varieties/selections from French fry (5), chipping (8) and fresh market (4) types were evaluated in a replicated trial.	Private industry, AAFC national breeding program, Michigan State University.	Potato Variety Trial Report – 2020 was published and distributed to growers and industry partners.	Trials proceeded as planned.