

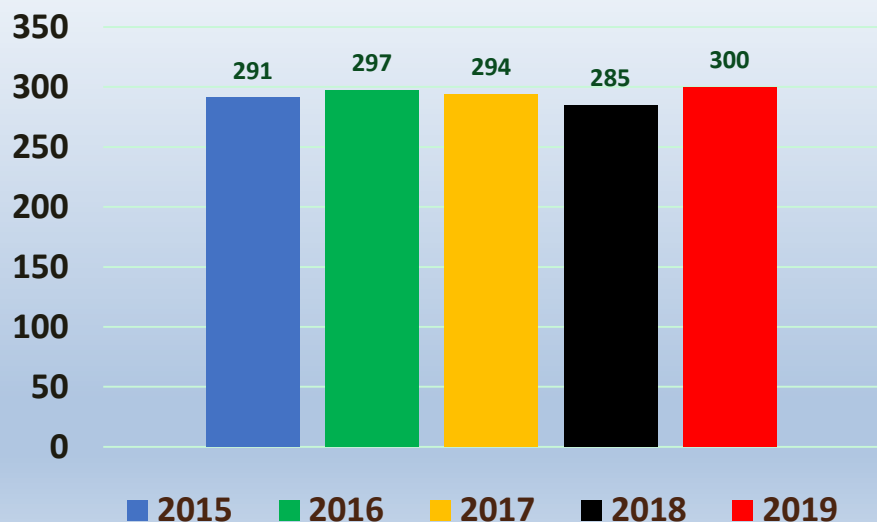


**VARIETY
DEVELOPMENT
PROGRAM**

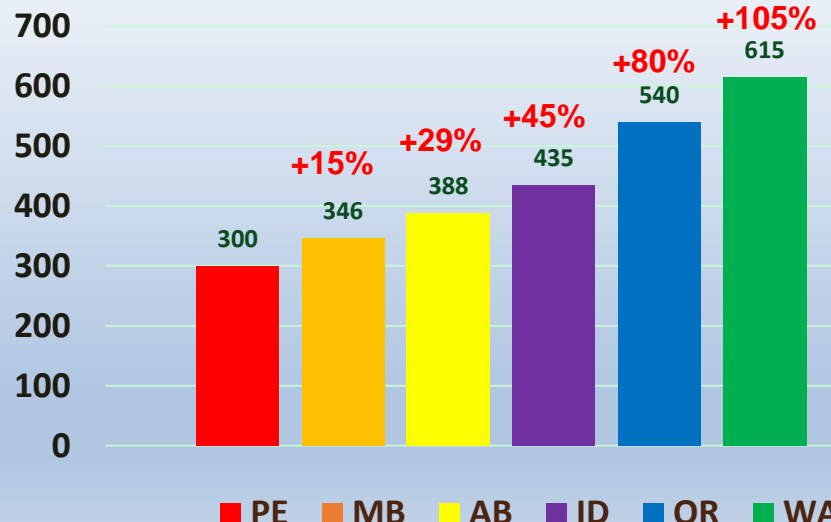


Yield increase is essential to make PEI Potato Industry more competitive

PEI Total Yield (cwt/ac)



2019 Total Yield (cwt/ac)



- Higher yields will :
- Allow growers to invest
 - Land, products, technology

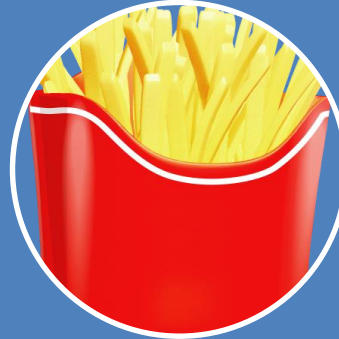
- ✓ Reduce Land Required
- Extend crop rotation
 - Soil quality improvement
 - Less use of risky areas

A new variety can benefit all potato industry stakeholders



For Farmers

To deliver varieties with lower crop inputs requirements, obtain higher yield crops in a sustainable and profitable way



For Customers

To help our customers to increase their competitiveness innovating the market and delivering great quality products



For Consumers

to provide the consumer with a product that meets and exceeds quality expectations and flavor, and is delivered in a responsible way.



Cavendish Farms variety screening program

1996 - 2009

- ✓ 1990's – part of the APERC trials
- ✓ 100+ clones and varieties tested from private and public breeders
- ✓ Focus on :
 - ✓ High yield
 - ✓ Processing quality
 - ✓ PVY, LB resistance

2010 - 2020

- ✓ 2015 – Own trials + collaboration with CHC
- ✓ 80+ clones and varieties tested from private and public breeders
- ✓ Focus on :
 - ✓ High yield
 - ✓ Processing quality
 - ✓ Scab, PED, PVY resistance

Cavendish Farms variety screening program

SMALL PLOT TRIALS

- ✓ Only processing clones / varieties
- ✓ Commercial varieties as control
- ✓ Replicated treatments
- ✓ CF Research Farm
- ✓ Assessment of 15 attributes



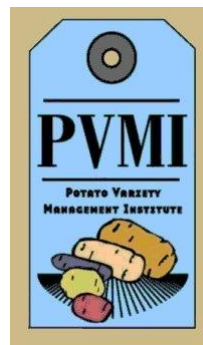
Testing varieties from various companies



HZPC
keeps you growing



Agriculture and
Agri-Food Canada



**Colorado
State**
University



Meijer 
Seed Potato Ltd **FOR SURE**

NDSU NORTH DAKOTA
STATE UNIVERSITY



Collecting information and generating data for each new tested variety



Breeder information

The image shows a detailed information card for the 'Ivory Russet' potato variety. It includes a small photo of the potato, a list of characteristics (e.g., 'Collection selected with potatoes', 'Early maturity', 'High dry matter content'), and a table of performance data across different regions and years.



Agronomy Trials

The image shows a close-up of potato plants growing in a field, with rows of green foliage and yellow markers in the soil.



Growers Demo Fields

The image shows a wide view of a potato field with rows of plants stretching into the distance under a cloudy sky.



Collecting information and generating data for each new tested variety



Breeder information

The Ivory Russet information card includes details about the variety, its characteristics, and its performance. It features a small image of the potato and a table of data.



Agronomy Trials

A photograph showing rows of potato plants in a field, used for agronomy trials.



Growers Demo Fields

A photograph showing a large field of potato plants, used for growers demo fields.



Cavendish Farms Ag Research Program

AGRICULTURAL RESEARCH



Research Plots :

- ❖ Potato varieties
- ❖ Fertility
- ❖ Disease control
- ❖ Seed Management
- ❖ Sustainable practices



STRATEGIC PARTNERSHIPS



Agriculture and
Agri-Food Canada



Canadian
Horticultural
Council

Conseil
canadien de
l'horticulture

The voice of Canadian fruit and vegetable growers



Collaboration with Agronomy Initiative for Marketable Yield (AIM Group)



Pests & Diseases



Soil & Fertility



Seed Management



Production & Technology

- ❖ Program partially funded by Cavendish Farms
- ❖ Research program dedicated to PEI processing growers
- ❖ Focus on local priorities
- ❖ 6 Years commitment



Ag Research Partnership with Canadian Horticultural Council

CURRENT AG RESEARCH PROJECTS

- Wireworm control 
- Potato Variety Evaluation 
- Colorado Potato Beetle control 
- Potato Early Dying control 
- Common scab management 


7:21 PM Thu Feb 21

hortcouncil.ca

Canadian Horticultural Council | Conseil canadien de l'horticulture
The voice of Canadian fruit and vegetable growers

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Current projects



The Canadian Horticultural Council (CHC) oversees the following research projects, funded primarily under Agriculture and Agri-Food Canada (AAFC)'s Growing Forward 2 program with industry support.

For more information on CHC's projects and programs, contact sargentino@hortcouncil.ca.

Apple research

- Optimizing Storage Technologies to Improve Efficiency, Reduce Energy Consumption, and Extend the Availability of Canadian Apples for Domestic and Export Markets [1]
- Improving Tree Fruit Storage Management Using Weather Based Predictions of Fruit Quality at Harvest [1]
- Performance of Honeycrisp on New Size-Controlling Rootstocks [1]
- New Biological Control Agents for Postharvest Diseases of Pome Fruit [1]
- Development of External CO2 Injury in 'Empire' Apples during Storage Room Loading [1]

Potato research

- Understanding of Potato Virus Y Complex in Canada and Development of a Comprehensive On-Farm Management Strategy [1]
- Wireworm Control in Potatoes and Strategic Rotational Crops in Canada [1]
- Development of a Rapid and Sensitive Triplex Nested Real-time PCR Method for Quantification of Verticillium in Soil [1]
- Zebra Chip and Potato Psyllid Survey and Monitoring [1]
- Nitrogen Management for Improved Yield, Quality and Profitability of Potato [1]
- Canadian Potato Variety Evaluation Program [1]
- Characterization and tracking of strains of potato late blight pathogen in Canada [2]
- Survey of Susceptibility to Diagnostic Concentrations of Registered Insecticides in Canadian Colorado Potato Beetle Populations [2]
- Market Development for the Canadian Potato Industry [4]

[1] Funded under Cluster 2, a research program led by CHC and generously funded by nearly 50 industry partners and *AgriInnovation*, an A&F's Canadian Forward 2 initiative that provides funding and/or resources to non-research organizations to support their research.

Collecting information and generating data for each new tested variety



Breeder information

The image shows a detailed breeder information card for the 'IVORY RUSSET' potato variety. It includes a small photo of the potato, a list of characteristics (e.g., 'Collection selected with previous FRENCH FRIES'), a table of growth characteristics (e.g., 'Plant height', 'Tuber yield'), and a list of references.



Agronomy Trials

The image shows a field of potato plants in rows, with a small yellow flag marking a specific plant. The plants are growing in a field with reddish-brown soil.



Growers Demo Fields

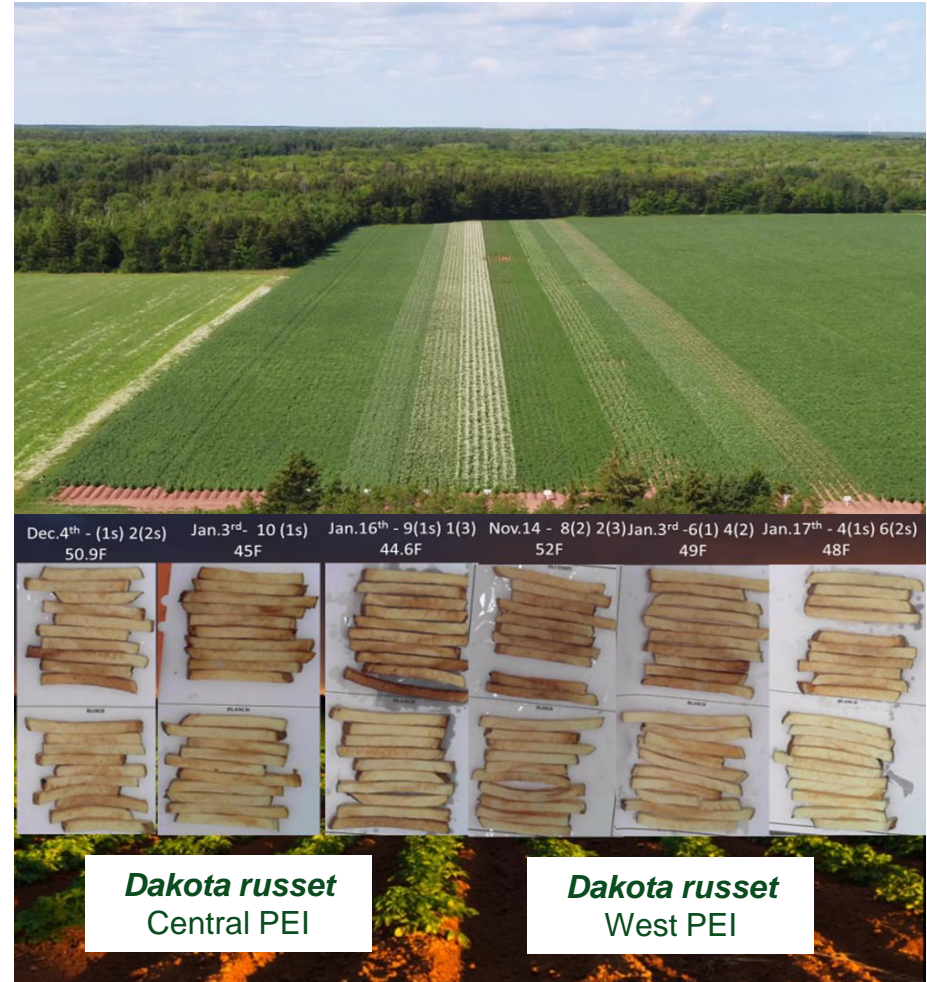
The image shows a large field of potato plants in rows, with a small yellow flag marking a specific plant. The plants are growing in a field with reddish-brown soil.



Demo fields with growers for performance evaluation under commercial conditions

GROWERS DEMO FIELDS

- ✓ Most promising varieties
- ✓ Innovative growers
- ✓ Diversified sites
- ✓ Include check varieties
- ✓ Commercial attributes
- ✓ Keep x Drop decision



Higher yield performance and better processing attributes

BENEFITS

✓ Increase grower income

- Allow growers to invest
- Land, Products, Technology

✓ Reduces Land Required

- Extend crop rotation
- Soil quality improvement
- Lower use of risky areas

Marketable Yield



Specific Gravity



Varieties tolerant to diseases can reduce the use of pesticides on potato crops

BENEFITS

- ✓ ↓ cost of production
- ✓ ↓ crop quality losses
- ✓ ↑ probabilities of \$\$\$
- ✓ ↓ risk to develop resistance
- ✓ Use of pesticides with ↓ toxicity
- ✓ ↓ risk to have fish kill events

Common scab



Shepody

Ranger
Russet

Dakota
Russet

Mountain
Gem

Blazer
Russet



Potato early dying



Russet
Burbank

Arbor
Globe

Dakota
Russet

Prospect

Payette
Russet



© Can Stock Photo - csp030530

Replacement of high demanding by low input varieties is a tool to reduce environmental impact

High N



Low N



- ✓ Replacement of Russet Burbank by Prospect
 - Nitrogen fertilizer needs
 - R. Burbank : 180 lbs/ac
 - Prospect : 130 lbs/ac (- 28%)
- ✓ Establishing optimal N fertilization for other varieties

Water management for potato crops

- ✓ **Proper use of limited resources to optimize investment in the potato crop**
 - **Gains of 100+ cwt/ac in Irrigated fields vs. Dryland**
 - **Variety dependent : response to irrigation (Yield, Defects)**
 - **Prospect : very tolerant to drought**



- ✓ **Varieties in the pipeline with drought tolerance**

Varieties with long-term storability can help growers to improve quality

✓ Selecting varieties tolerant to cold-sweetening

- Lower reducing sugars
- Store at lower temperature

BENEFITS

- ✓ Reduction of shrinkage losses
- ✓ Better raw potato quality



Short-term

Shepody

Ranger
Russet

Mountain
Gem

Dakota
Russet

Long-term

Prospect

Development of specific technical package for each variety



Breeder information



Agronomy Trials



Growers Demo Fields



DAKOTA RUSSET

MANAGEMENT PROFILE
FOR PEI GROWING CONDITIONS

GENERAL INFORMATION

Mid maturity variety (14 days later than Shepody), with medium sized and upright plants, high yield potential, good processing quality, high specific gravity and mid-term storability

VARIETY STRENGTHS

- High yield potential and high specific gravity
- Good processing quality, resistant to sugar ends and bruise
- Tolerant of common scab
- More tolerant to early dying than RB

WATCH OUT FOR

- Sets high on the hill, potentially exposing tubers to greening/sunburn
- Susceptible to black leg
- Prone to seed piece decay, which causes erratic emergence
- Sensitive to "Phoe-acid" at regular rates, could show symptoms of phytotoxicity on leaves
- Strong apical dominance (lower number of stems)
- Low number of eyes, require larger seed pieces to avoid blind sets

TUBER CHARACTERISTICS

TUBER SHAPE	Long and Blocky
SKIN TEXTURE	Light Golden Russet
FLESH COLOR	White
TUBER SIZE	Large
TUBER SET	Medium (7-8 tubers)
DENSITY OF EYES	Low
DORMANCY	Medium
SPECIFIC GRAVITY	High (1.086)

BEST CULTURAL PRACTICES

SPACING : 9-12"

FERTILIZATION : Maximum 160-180 lbs/ac N, 200 lbs/ac P and 200 lbs/ac K. N fertilization should be split between planting and hilling. Under irrigation this variety works better with N applications in smaller doses than fewer large doses.

PLANTING : Plant when soil temperature is warmer than 50F (10°C). Use good quality seed (clean of black leg/soft rot). Cut seed needs to be treated and dried out as quick as possible under forced ventilation for 10-14 days before planting (pile up to 3' height); that prevents seed rot and helps to break apical dominance.

OTHER INFO : To reduce sunburn tubers a good hilling or cultivation when plants reach up to 8" height (beds need to be high and wide, not pointed); up to 2 hilling operations may be required. This variety has a positive response to irrigation, but avoid to use surface water on seed crops.

HARVEST : Should be harvested before Oct. 15th to avoid risk of frost damage.

STORAGE : Store at 45F (7°C) for 8 months

Material developed by Cavendish Farms – April 2019



What is coming in the variety pipeline

COMMERCIAL VARIETIES

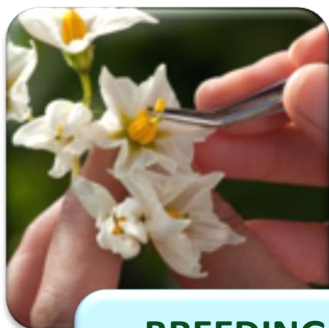
- ✓ *Blazer Russet*
- ✓ *Ivory Russet*
- ✓ *Ranger Russet*
- ✓ *Russet Burbank*
- ✓ *Shepody*

Clearwater Russet
Dakota Russet
Mountain Gem
Russet

Alverstone Russet
Payette Russet
Targhee Russet

New clones
New Varieties

New approach to get a processing potato variety adapted to Eastern Canada



BREEDING

- Prioritize desired traits
- Choose Parental lines
- Make Crossings
- Obtain families



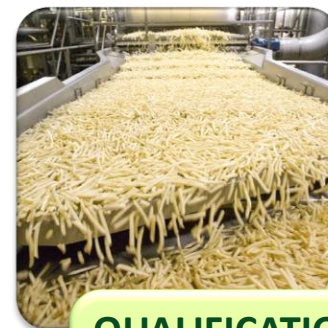
SCREENING

- Assessment of clones
- Select best lines with desired traits
- Advanced lines



DEVELOPMENT

- Small Plot Trials
- Agronomy Trials
- Generate "recipe" for each variety
- Demo plots with growers



QUALIFICATION

- Commercial fields
- Processing runs
- Storage Trials
- Formal approval

1990's - 2018

2019+

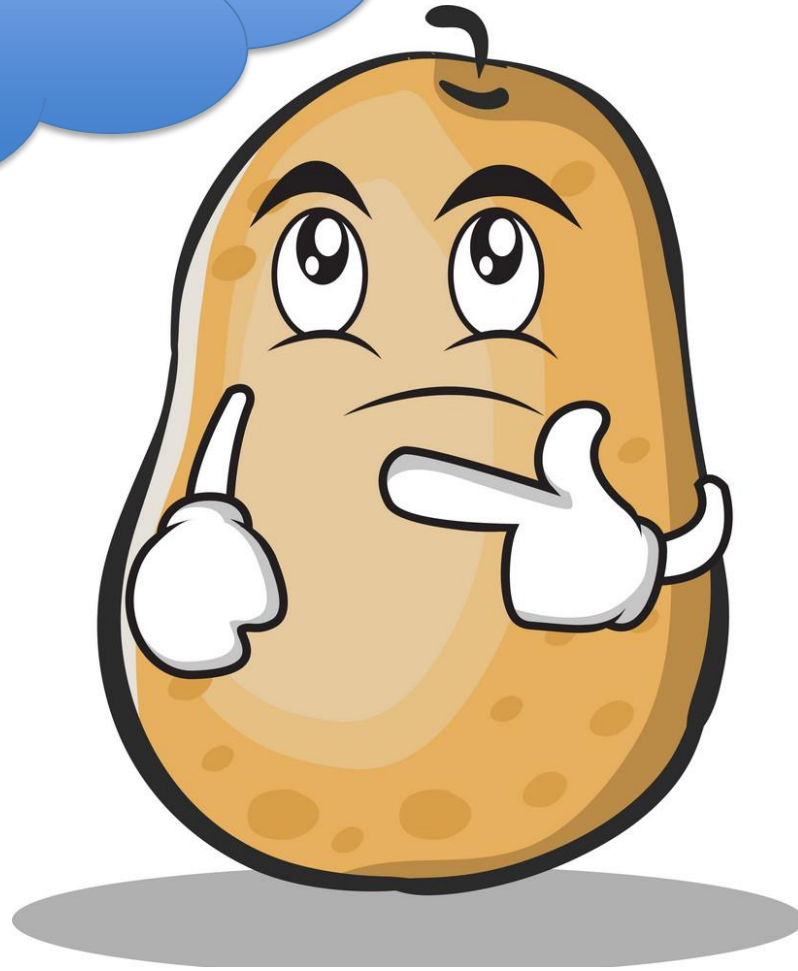
Cavendish Farms Potato Breeding Program

Local potato breeding program created to be a driver for a sustainable potato industry on PEI



- ❖ Privately funded and operated
- ❖ \$ 6M investment
- ❖ Get varieties adapted to local conditions
- ❖ Long term program
- ❖ Benefit to the PEI potato industry

QUESTIONS ???



POTATOES



MAKE ME HAPPY

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A
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Y
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U**



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