PEI INDUSTRY POTATO VARIETY TRIAL

Funded by the PEI Potato Board, fees for private variety entries and the Canadian Horticultural Council National Potato Research Cluster with funding from the Canadian Agriculture Partnership (CAP) program.

STEPS FROM THE INITIAL CROSS TO COMMERCIAL ACCEPTANCE


F10014
x
F11009

Pipeline

Germplasm exchange

Year 1 — 1 hill

Year 2 — 4 hill

Year 3 — 20 hill

Year 4 — 50 hills

Year 5 — Evaluation Trials-Tier 1

Year 6 — Evaluation Trials-Tier 2

Year 7-8 — Industry Trials
(virus free material produced for advanced selections)

Year 9-11 — Commercialization agreements & Cultivar registration/protection
Seed propagation and continued evaluation

National Potato Variety Trials

Industry Feedback

Breeder Selection

THE SELECTION PROCESS

- Discarding lines that have obvious weaknesses – such as poor type, low set, weak plants, notable disease susceptibility such as high scab incidence, etc.
- If looking for specific trait can screen early lines or seedlings using specific tools – i.e inoculate with late blight to identify clones resistant to the disease.
- Later years, as replanting saved seed - note visual disease resistance – such as low mosaic incidence, lack of rhizoctonia or scab, etc., adaptation traits – such as drought resistance – and consistency of results.
- Further in selection process, as numbers are reduced, can afford more stringent screening - processing quality, eating quality, etc. – and to increase to replicated plots and commercial evaluation plots.

PEI TRIAL VARIETY ENTRANTS

- Standards
- Promising lines from AAFC
- Submissions from Variety Agents
- Non-exclusive private or public varieties identified by staff or growers as having promise for PEI

If growers are interested in a variety they see in the trial – seed is usually available for on-farm evaluation the next year.

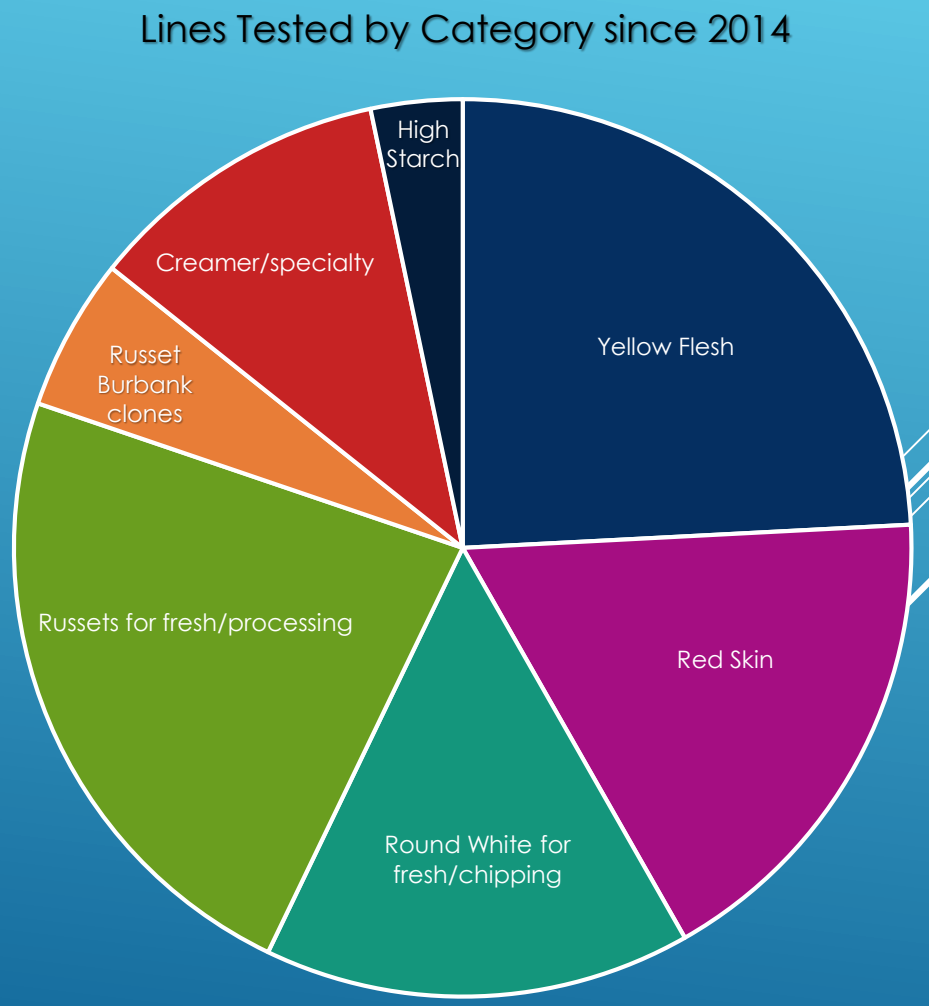
CATEGORIES

- Russets and long whites for processing
- Russets for fresh
- Whites
- Red Skin
- Yellow Flesh
- Creamers and Specialty lines

Number of lines and varieties evaluated :

Yellow Flesh	22
Red Skin	16
Round white fresh/chipping	14
Russets for fresh/processing	21
Russet Burbank Clones	5
Creamer/Specialty	10
High starch	3
	91

SINCE 2014



WHERE & HOW

- Collaboration with AAFC (David Main)
- Trial is conducted at Harrington Research Station
- Small plot research trial
- Randomized four block design
- Spacing and fertility may vary according to variety needs that are identified by an agent – but in general standard practices will be followed for each category

FIELD EVALUATION

- Emergence and plant stand
- Early vigor
- Mid-season vigor
- Maturity
- Tuber Appearance
- Any obvious visual physiological, disease or insect related strengths or weaknesses.

FIELD DAYS

POST HARVEST EVALUATION

- Total and marketable yield using an optical grader (grade based on category)
- Tuber count and average tuber weight
- Specific gravity
- Tuber external shape and appearance
- Sample cut to assess internal defects

Potato Cultivar Evaluation Trial Report – 2017

Agri-Science Cluster Project

Agriculture and Agri-Food Canada and Canadian Horticultural Council

January 26, 2018

Collaborators:

David Main, Agriculture and Agri-Food Canada

Mary Kay Sonier, PEI Potato Board

Agriculture and Agri-Food Canada | Agriculture et Agroalimentaire Canada

Canada

National Potato Research Cluster

PEI Variety Evaluation Trial

by David Main, Agriculture and Agri-Food Canada, Charlottetown, and Mary Kay Sonier, PEI Potato Board

The industry sponsored variety evaluation trial is conducted at the AAFC Harrington Research Farm under the direction of Mary Kay Sonier, Seed Coordinator, PEI Potato Board and David Main, Biologist with Agriculture and Agri-Food Canada. The project is supported by industry and the federal government through the recently announced National Potato Cluster Research Project that runs from 2018 to 2023.

Invitations to submit entries to the trial are extended to local private variety agents, the PEI Potato Board and AAFC. Participants in 2018 included Real Potatoes, Parkland Seed Potatoes and AAFC. There were 15 entries in 2018. The objective of the trial was to evaluate the performance of advanced breeding selections (8) and recently released varieties (7) in comparison to standard varieties (4) for yield and quality under PEI growing conditions.

Potatoes were hand-planted on May 30 into soil with pH 5.9 and organic matter content of 2.9%. Individual plots were 25 foot long single rows, replicated four times in a randomized complete block design. Fertilizer was banded at planting at 90 kg ha-1 of N and 180 kg ha-1 of P2O5 and K2O using a 2-row potato planter with hillers removed. All plots received additional N at 90 kg ha-1 on July 11 with the exception of Basin Russet, Innovator, FOB2005-136-181 and WW-10-46 which received 100 kg ha-1 of N on the same date. Seed piece spacing was 10 inches within row and three feet between rows with the exception of WW-10-46 at 12 and 14 inch in row spacing, AR2018-11 at 6 inch in-row spacing, Basin Russet and FOB2005-136-181 at 9 inch in-row spacing and AR2017-02, Bridget and Russet Burbank at 12 inch in-row spacing. Pest control products included Admire®, Capture®, Sencor®, Bravo® 500 and Manzate®.

Crops previous to potato were barley under-seeded to red clover in 2016 and two plantings of brown mustard in 2017. Final cultivation and hilling took place July 11. Reglone® was applied on September 24, 117 days after planting and the trial was machine harvested on October 15.

Harvested samples were graded in November based on fresh, fresh creamer and processing standards. Trial entries are assessed against the standard for each category.

Russet-skinned, Fresh-market Selections

Basin Russet, Innovator and FOB2005-136-181 outperformed the standard Goldrush in Canada No. 1 yield. Basin Russet produced the highest Canada No. 1 yield with the exception of Innovator. WW-10-46 had the greatest yield of small-sized tubers regardless of in-row spacing. Highest average tuber weight was achieved by Basin Russet followed by Innovator and FOB2005-136-181. Specific gravity values ranged from 1.080 to 1.098.

Tuber Yield and Specific Gravity for Entries of Red-skinned Potatoes Grown at AAFC, Harrington in 2018.

Selection/ Cultivar	Total	< 1.5"	Small	Canada No. 1	Large	Cull	Mkt	Specific Gravity
	(metric tonne / Ha)							
AR2017-09	33.7	1.9	19.5	12.1	0	0.13	31.6	1.083
AR2017-12	32.2	0.4	12.7	18.7	0	0.41	31.4	1.077
AR2017-15	49.6	1.0	24.2	23.9	0	0.52	48.1	1.084
Norland	26.2	1.0	19.8	5.1	0	0.39	24.9	1.065

Red-skinned Selections

All selections outperformed the standard Norland in Canada No. 1, marketable and total tuber yield. AR2017-15 was the highest yielding red-skinned entry and all entries had higher specific gravity than Norland.

Yellow-skinned Selections

Constance and Yukon Gold had very good tuber appearance and no sign of hollow heart was noted in either entry. Constance outperformed the standard Yukon Gold in small, marketable and total tuber yield. Constance had lower specific gravity than Yukon Gold.

White-skinned Selections

Volare had the highest average tuber weight and by far the greatest Canada No. 1, marketable and total tuber yield.

FULL REPORT

PURPOSE OF LOCAL VARIETY TRIALS IS TWO FOLD

IDENTIFY DEFECTS THAT MAY NOT HAVE SHOWN UP PREVIOUSLY OR IN OTHER GROWING ENVIRONMENTS

TEST PROMISING LINES DEVELOPED IN CANADA AND ELSEWHERE TO IDENTIFY VARIETIES

THAT ARE WELL ADAPTED TO DIFFERENT ENVIRONMENTS AND PERFORM WELL UNDER PEI CONDITIONS

PREVIOUS TRIAL ENTRIES THAT ARE NOW ON THE TOP 50 LIST OF VARIETIES ENTERED FOR CANADIAN SEED CERTIFICATION

▸ **ELECTRA**	**Real Potatoes**	**High yielding, yellow flesh, high percent Canada number 1 size, low specific gravity.**
▸ **COLOMBA**	**HZPC**	**Yellow flesh, round-oval, early maturing, promoted for having exceptional taste.**
▸ **ROKO**	**Parkland Seed Potatoes**	**Red skin, oval to round shape with good yields. Mid-late maturity with good PVY resistance.**

▸ IVORY RUSSET	HZPC	Medium-early maturing variety suitable for the French fry processing and fresh market.
▸ CLEARWATER RUSSET	PVMI	Medium-late maturing variety with high specific gravity and excellent fry colour out of storage.
▸ HIGHLAND RUSSET	PVMI	Mid-late season variety with high yields and good drought tolerance. Some susceptibility to scab.

ENTRIES SINCE 2014

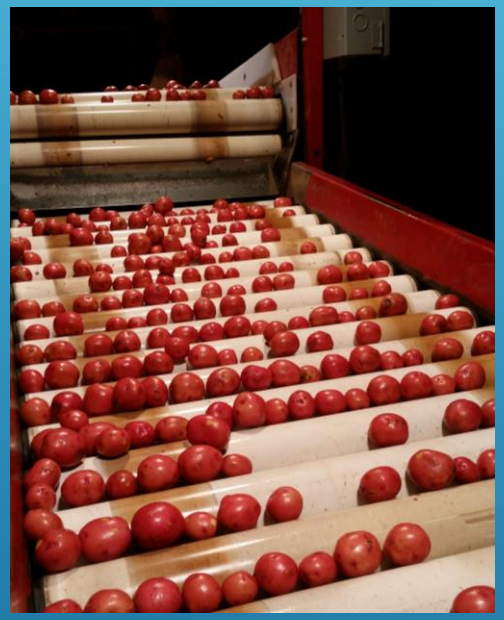
WITH SOME ACREAGE GROWN IN PEI

FOR SEED OR COMMERCIAL MARKETS

OR ARE STILL UNDER EVALUATION

RED SELECTIONS

Island Ruby – red creamer AR2012-09



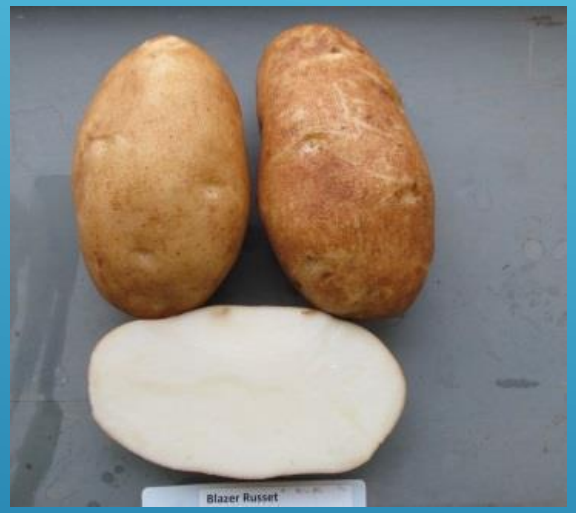
AR2018-11 – red creamer

AR2014-11 – red, fresh market

RUSSETS

Bridget

Blazer Russet



Payette Russet

Thank you to our collaborators at AAFC, variety agents who provide material for testing and the growers for their interest and research funding.