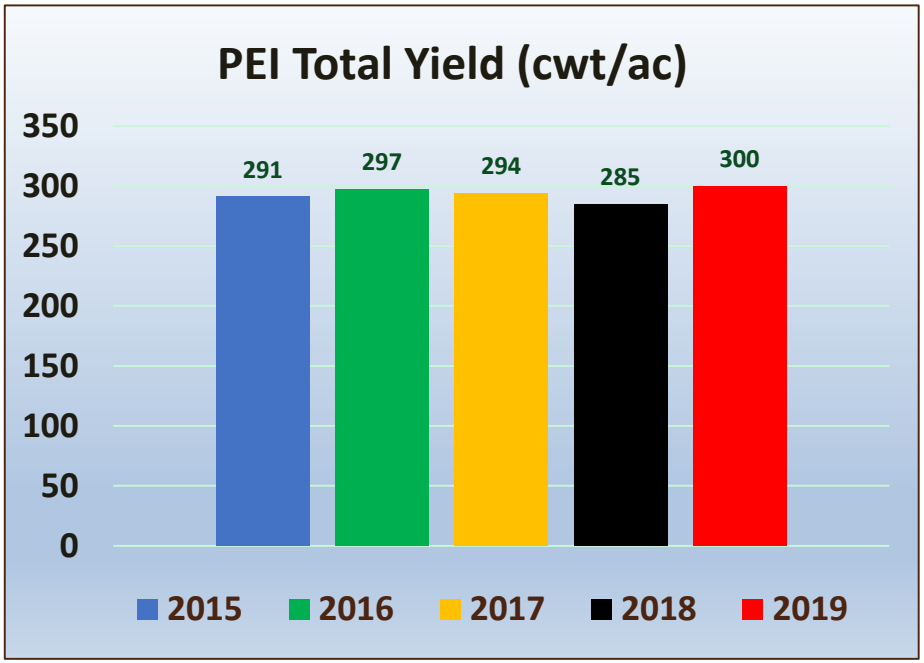
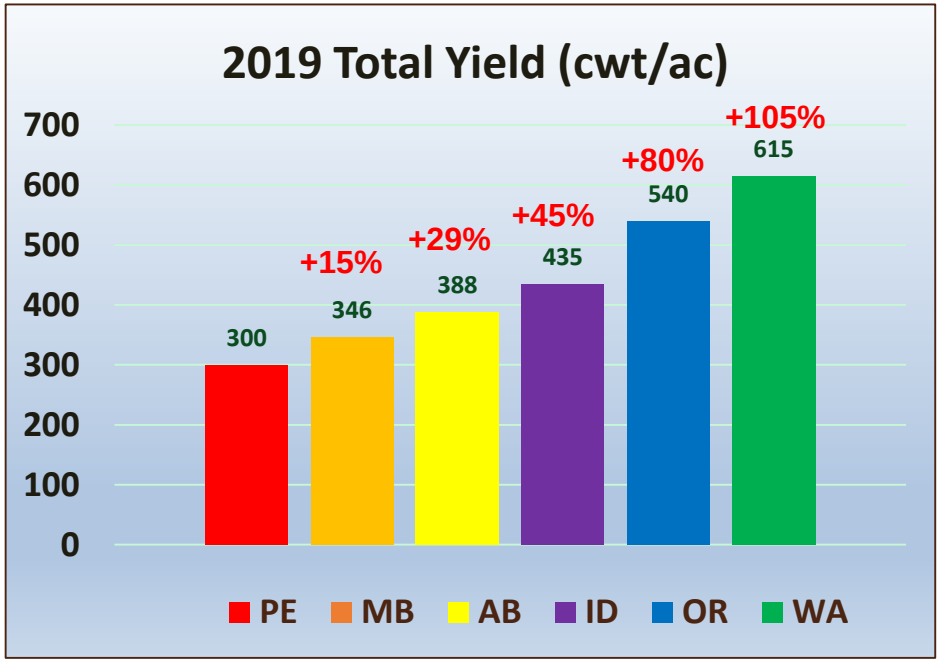
Les Fermes Cavendish Farms®

VARIETY DEVELOPMENT PROGRAM

Yield increase is essential to make PEI Potato Industry more competitive





- ➢ **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.

Les Fermes Cavendish Farms

International Potato Technology Expo

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

PVMI
Potato Variety
Management Institute

Colorado
State
University

AGRICO

Meijer
Seed Potato Ltd
FOR SURE

NDSU NORTH DAKOTA STATE UNIVERSITY

EUROPLANT

Solana

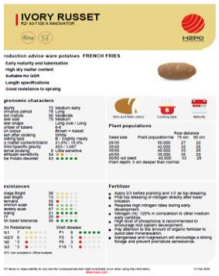
REAL POTATOES Ltd

1865 THE UNIVERSITY OF MAINE

Les Fermes
Cavendish
Farms

INTERNATIONAL POTATO TECHNOLOGY EXPO

Collecting information and generating data for each new tested variety



Breeder information

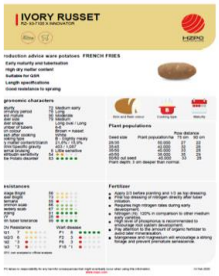
Agronomy Trials

Growers Demo Fields

Les Fermes Cavendish Farms

International Potato Technology Expo

Collecting information and generating data for each new tested variety



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International Potato Technology Expo

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

Prince Edward Island POTATOES

Les Fermes Cavendish Farms

Prince Edward Island CANADA

Canadian Horticultural Council | Conseil canadien de l'horticulture

The voice of Canadian fruit and vegetable growers

Les Fermes Cavendish Farms

INTERNATIONAL POTATO TECHNOLOGY EXPO

Collaboration with Agronomy Initiative for Marketable Yield (AIM Group)

Pests & Diseases

Soil & Fertility

Seed Management

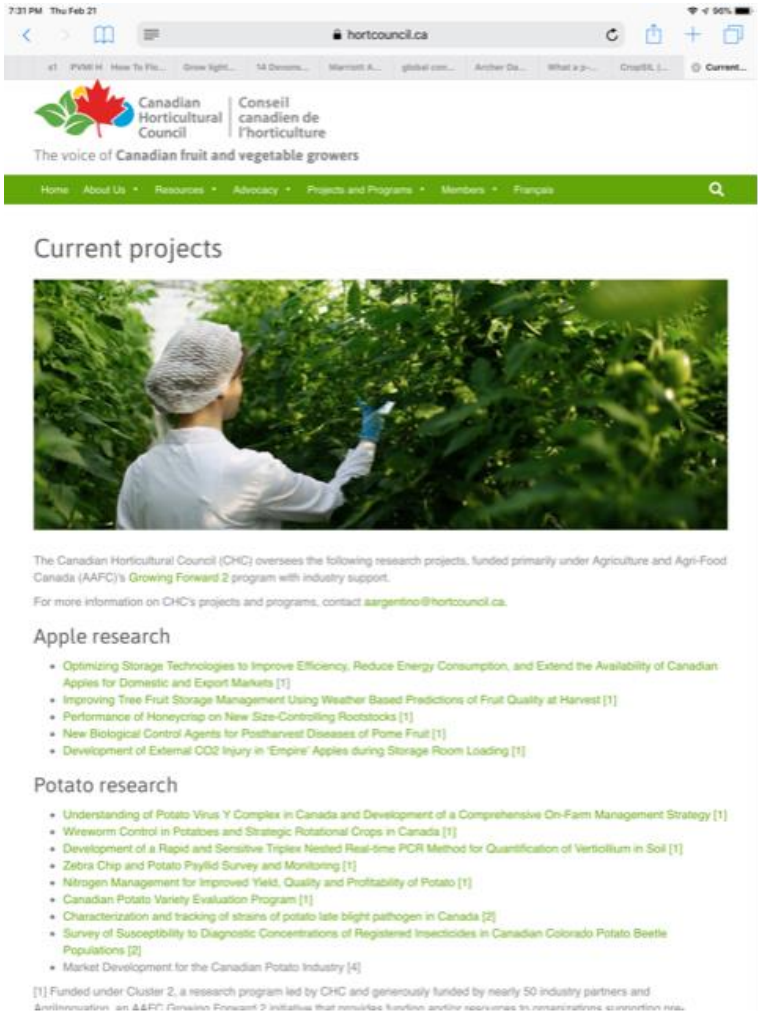
Production & Technology

- 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



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International Potato Technology Expo

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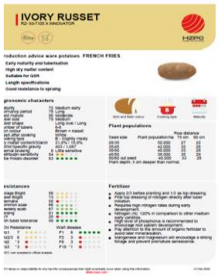

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International Potato Technology Expo

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

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International Potato Technology Expo

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

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

- ✓ **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 ***Long-term***

Shepody → Ranger Russet → Mountain Gem → Dakota Russet → Prospect

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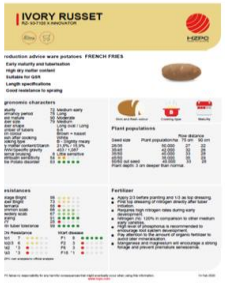
Development of specific technical package for each variety



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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 "Phos-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.

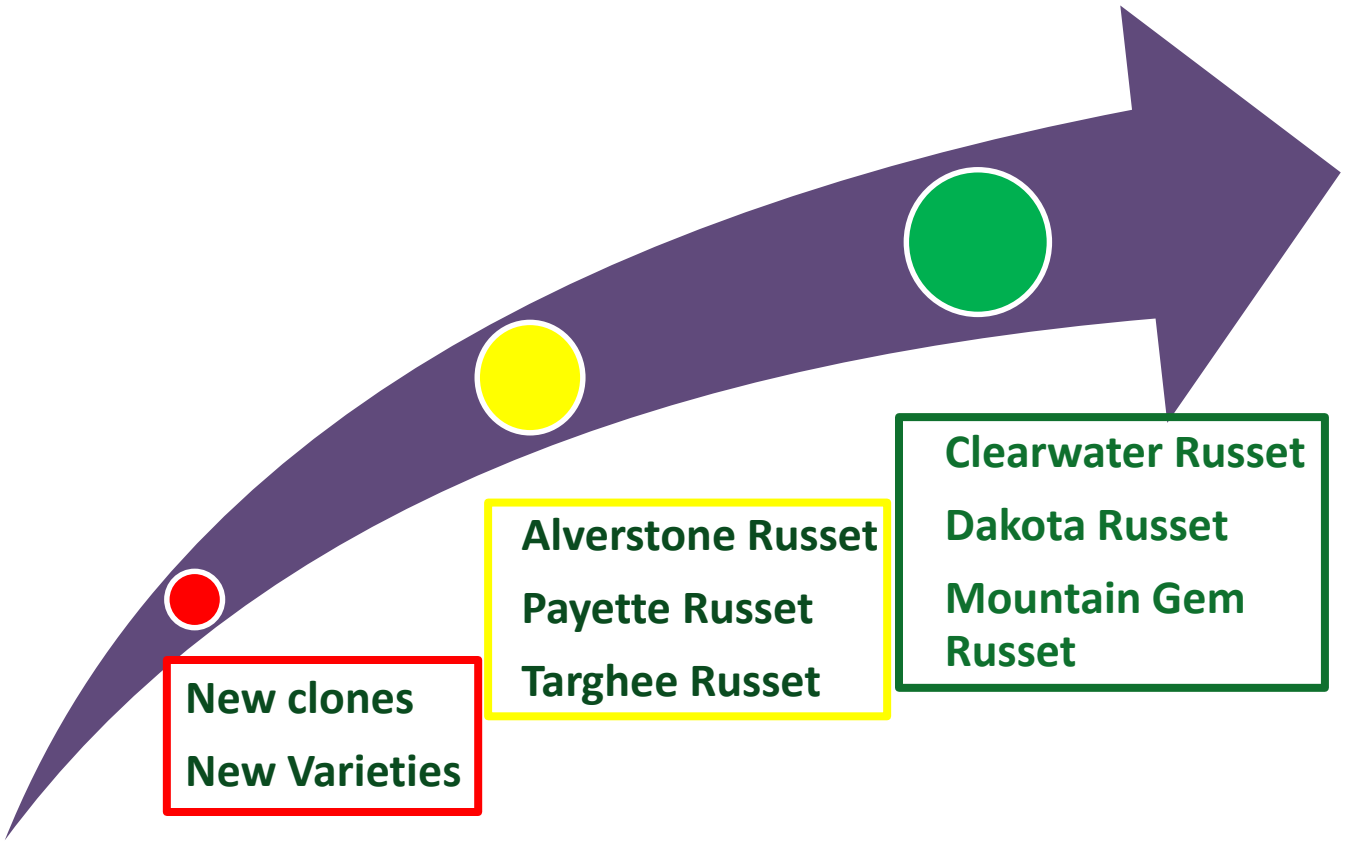
OTHER INFO : To reduce sunburn tubers a good hilling or cultivation when plants reach up to 8" height (beds need to be high and wide, not pointed); up to 2 hilling operations may be required. This variety has a positive response to irrigation, but avoid to use surface water on seed crops.

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



New clones

New Varieties

Alverstone Russet

Payette Russet

Targhee Russet

Clearwater Russet

Dakota Russet

Mountain Gem Russet

COMMERCIAL VARIETIES

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

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+

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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

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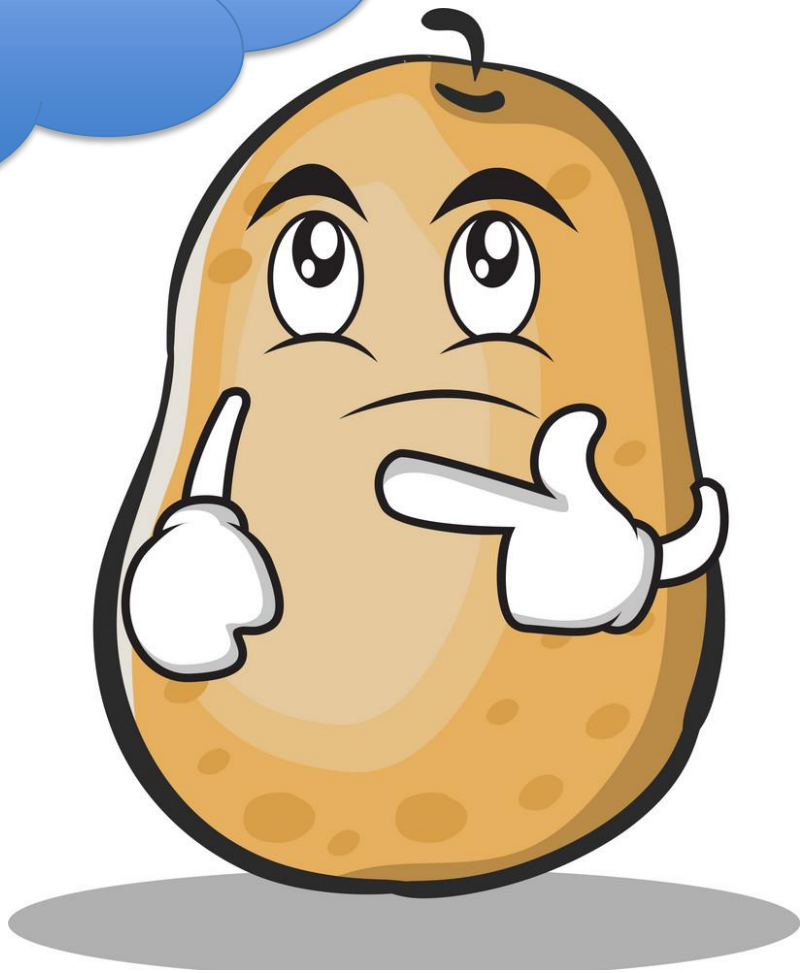
QUESTIONS ???



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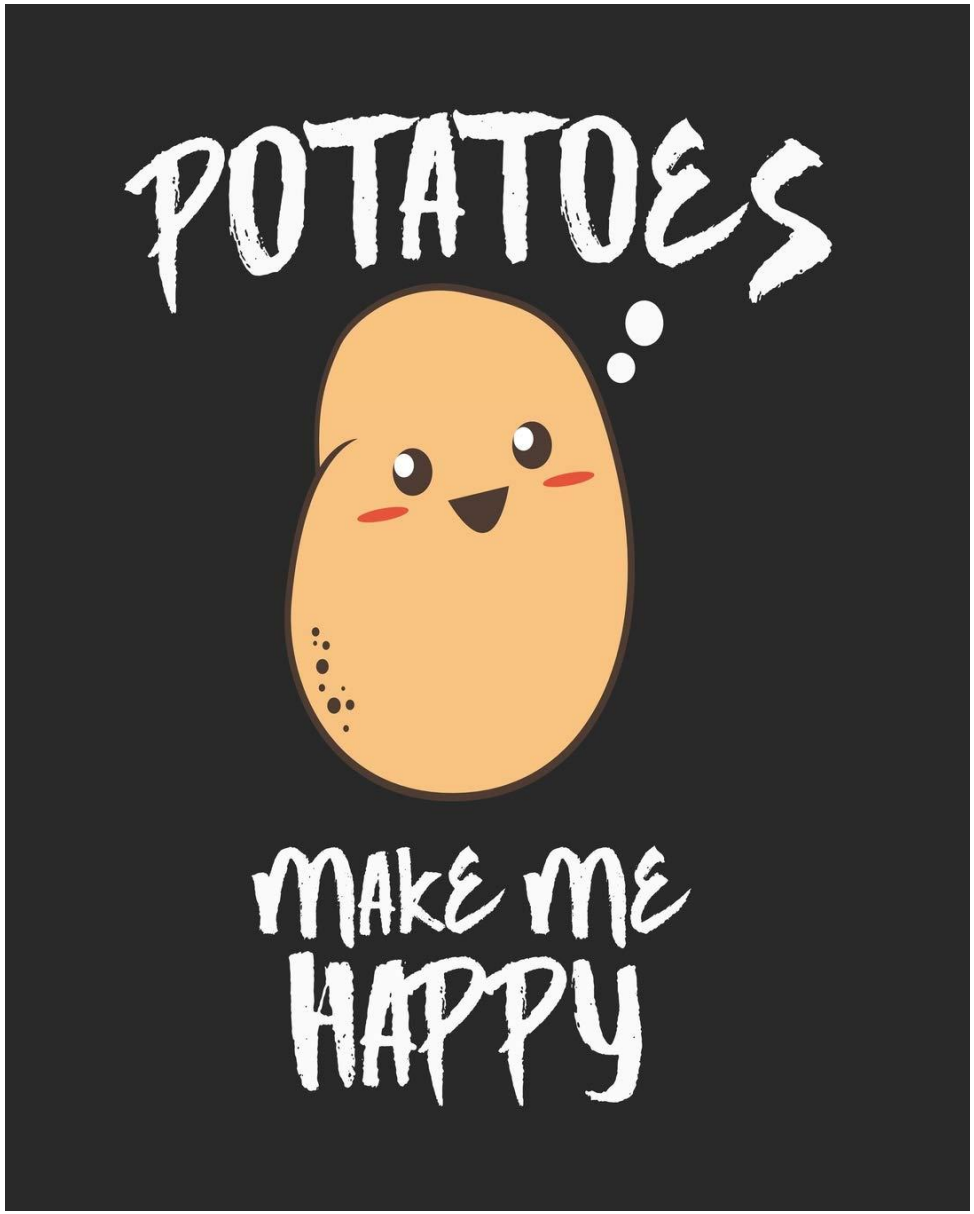

THANK YOU

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