# **Crop-Climate Project 2016** Heritage Potato Field Trials

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### **2016 MILESTONES**

- Third year of comprehensive Field Trials of 12 potato varieties across Canada, observations of an additional 10 varieties
- Distributed hundreds of heritage seed potatoes to interested growers
- Cultural practices such as spacing and irrigation tested
- First Nations in Yukon growing potatoes to improve food security
- Release of virally free variety Likely from our project by Canada Gene Resource Bank of Agriculture Canada
- Increased exchange of information and advice between growers and public and strong interest from volunteer testers
- Carried out public outreach through lectures, webcasts, participation in Seedy Saturday events, articles and website

### **CLIMATE SMART AGRICULTURE**

# Rapid climate change presents unprecedented challenges to our ability to feed ourselves.

Current food production is largely based on a few mass-produced, genetically uniform varieties. This is "few-eggs-in-a-few-baskets" puts global food supply at high risk to highly variable growing conditions. We advocate a diffuse adaptation approach akin to placing "many-eggs-inmany-baskets".

Growing a diversity of crops diffuses the risk to climate uncertainty. Heritage varieties contain vital traits for adaptation to different climatic characteristics as reflected in growing season weather. They have important genetic variation that may protect them against emerging diseases.



#### Conserve-Observe-Share

Farmer-Scientists of the Crop-Climate Project across Canada grow and document the performance of heritage varieties as climates change. We advance knowledge on the influence of climate stressors (heat, drought, pests etc.) on heritage potato growth and development across a wide range of climates in Canada. We share knowledge of cultural practices to optimize quality and yield. We identify heritage varieties suited to different climate conditions and increase their availability across Canada.

The approach involves cultivating many varieties in many sites and documenting their performance while continuously recording weather variables. The performance of varieties is then summarized and analyzed. Heritage varieties provide adaptation options to farmers and Canadian society in the coming times of climatic uncertainty – but only if we conserve and observe them now and make them widely available.

#### **Monitoring Heritage Potatoes in Saanich BC**

#### **Grower Observations**



Grower observations over time can contribute to climate change adaptation. R. Hebda has monitored heritage potatoes in Saanich BC for years. In 2016, a warmer and drier than average year resulted in lower than average yields as well differences

in the relative performance of varieties.

Ozette Nootka yielded less than half of its 2014 high, perhaps because of mid-season climate moisture deficit. It also completely died back by the end of August. In other years, it has been green up until October

Mrs. Moehrle's Yellow Flesher also had low yields. For the first time in our trials, rust was observed midseason, and the entire crop abruptly died, much earlier than typical.

See full report for help on interpreting graphs.

#### V. Huff and R.J. Hebda 2017



Yield of 16 varieties grown in Saanich BC in 2016.





Growth and development of Ozette-Nootka and Mrs. Moehrle's Yellow in Saanich BC, 2016, with observers comments included.



Timeline of weather-induced stresses likely to reduce potato yield and/or quality.



## **Key Findings**

Several heritage varieties are more productive than conventional varieties.

Potato seed availability is a barrier to wider adoption of heritage potatoes.

Timing of stress events such as heat, drought, and frost affects growth and development of some varieties more than others.

Agronomic trials provided insight into spacing, timing of seeding and irrigation for future growers.

Insects and diseases were documented for the first time on some heritage varieties and their out breaks need to be related to climate.

Analyzing the timing of stressors against the development of potato may lead to better production practices.

Potato tasting trial in Yukon highlights the importance of involving the community in all aspects of food security planning.





#### The Honest Food Approach

As the climate changes, our agriculture system must do more than grow more food, it must be built on principles that address social, environmental, economic contexts.

"Honest Food" principles, introduced by R. Hebda and adopted by the Canadian Climate Forum, guide us in planning the Crop-Climate Project.

## 1. Ensure reliable and affordable food for all

- 2. Mitigate and adapt to climate change
- 3. Sustain ecological integrity
- 4. Sustain the diversity of life
- 5. Contribute to human communities
- 6. Respect and reward growers
- 7. Improve people's health
- 8. Build sustainable economies
- 9. Meet measurable and objective standards
- 10. Incorporate public education and awareness

# Corne de Mouton from planting to harvest

#### Gananoque ON

Seed potatoes:



Growth at 45 days:



Growth at 60 days:



Tuber harvest (single plant):



All photographs: Chris Wooding

#### **Next Steps**

There is wide public interest in growing heritage varieties and sharing the experiences of the growers.

Demand for clean seed of heritage varieties continues to grow.

Information on best practices for growing, storing, and preparing heritage varieties needs to be increased and made widely available widely.

Heritage varieties provide adaptation options to farmers and Canadian society in the coming times of climatic uncertainty – but only if we conserve our agricultural heritage, carefully observe and document their growth, and make the seeds and the information widely available.

### 2017 - 2018 Workplan

Compile data and prepare comprehensive report on 3 years of crop climate trials for early 2018. Continuing from 2017.

Continue coordination of project participants and experiments of regular participants and involvement of additional volunteer growers from a wider range of climates.

Disseminate results through the website, public presentations, and articles by adding information on other varieties: winter spring 2017-18.

Support interested growers with seed, advice and outreach lectures.

Ensure tuber availability for wide distribution and expand heritage seed production: 2018 growing season growers Elder and Wooding

Support expanded heritage seed production of key varieties

Field test Likely and heritage potato clones released by Ag Canada, and newly bred heritage-based varieties (from Hebda), Spring & Summer 2018

Expand the project website information on additional heritage varieties by consulting heritage variety (seed) growers 2017-18

Prepare simple on-line manual for future users. January -March 2018

Develop formal and tighter links with programs such as Seeds of Diversity, Bauta Seed initiative, other growers: winter 2017 spring 2018. Summarize their potato information variety by variety on our Website

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