# Characterization and Tracking of Potato Blight Pathogen in Canada

## Progress Report March 2017

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<td>Government and industry collaborators across Canada</td>
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## Activity Objectives (as per approved workplan):

**Activity 1:** To identify strains of *Phytophthora infestans* causing late blight of potato in production areas across Canada and to develop a map showing the distribution of strains in this country.

**Activity 2:** To assess novel potato late blight pathogen strains for their ability to cause disease in foliage and tubers of registered cultivars and hence determine field and storage disease risk.

**Activity 3:** To ascertain the influence of environment on spore production, infection and survival of major potato late blight pathogen strains.

## Research Progress to Date:

### Activity 1:

Over 80 samples of plant tissues with late blight were received in Charlottetown and Lethbridge in 2016 representing disease incidences in BC, AB, MB, SK, QC, NB and PEI. The most severe late blight epidemic occurred in MB in 2016. Multiple isolates of the late blight pathogen were recovered from each sample and a subset was fully characterized. Results showed that the majority of isolates from across Canada were of the US-23 genotype (A1); however the US-8 genotype (A2) was recovered in BC and both US-23 (A1) and US-24 (A1) genotypes were recovered from samples from Quebec. Isolates of US-23 were often sensitive to metalaxyl-m (Ridomil) early in the season but showed increasing resistance to this chemical as the season progressed.
Activity 2:

Greenhouse trials were conducted to compare the aggressiveness of the different late blight pathogen strains on various hosts, including different potato cultivars and various tomato, pepper and petunia varieties. US-23 was less aggressive on potato foliage than US-8 or US-24, but was very aggressive on tomato foliage (conversely, US-8 and US-24 were less aggressive on tomato). Only trace disease was found on pepper or petunia. Tomato varieties varied in their response to disease, and those varieties with at least 2 known late blight resistance genes were highly resistant to disease caused by US-23. Most commonly-grown tomato varieties were very susceptible to disease caused by US-23. Tuber inoculation studies conducted in a potato storage showed that both US-23 and US-24 were as aggressive or more aggressive than US-8 on potato tubers and caused severe tuber rot. Commonly grown commercial potato cultivars were all susceptible to tuber rot caused by these pathogen strains.

Activity 3:

Growthroom studies were conducted that compared infection, disease progression and sporulation of the pathogen strains at different temperatures. Results are being analyzed and these studies will be repeated and augmented moving forward before any firm conclusions can be drawn.

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

Conference Abstracts


Technical Presentations

March 1, 2016. Ontario Potato Conference. Delta Hotel & Conference Centre, Guelph, ON. Presentation: Late Blight: All You Need to Know to Win the Battle.

March 3, 2016. McCain Foods (Canada) Spring Grower Meeting. Meyers Norris Penny Exhibition Building, Portage la Prairie, MB. Presentation: Managing Pink Rot and Late Blight in Canada


### Technical Publications


### Interviews and News Releases

Topic: The current status of late blight in Canada.


### Early Outcomes (if any) or Challenges:

- US-23 is the major strain of the late blight pathogen in Canada, but other genotypes still occur and cause disease
- US-23 is less aggressive on potato foliage, but very aggressive on tubers
- Tomato is now a key player in late blight epidemic development in commercial potato production areas
- Available LB-resistant tomato varieties are effective tools to manage disease emanating from home gardens
- The challenge of getting the message out to all industries in Canada and the general public remains – we still have much work to do in several provinces!

### Key Message(s):

The epidemiology of late blight has completely changed in Canada with the distribution and spread of new pathogen strains. Infected tomatoes found in retail outlets and home gardens are now key factors in the spread of disease among regions and in the spread of inoculum to commercial production areas. We are engaging in various tech transfer initiatives (radio, TV, meetings, LB-resistant tomato seed distribution) with the industry and the general public to raise awareness of the issue. Controlling the initial inoculum at the start of the season is key to managing this disease. Although some sensitivity to Ridomil has been found in US-23, at most only one application early in the season can be beneficial; late pathogen populations are more insensitive to this chemistry. Classical and novel late blight fungicide tools are effective against the new strains as are other classic control measures, including disposal of culls, destruction of volunteer potatoes and the use of clean/treated potato seed.