LATE BLIGHT IN THE EASTERN PROVINCES OF CANADA

GENERAL REMARKS

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Quebec-CANADA

Segundo Taller-Tizón Tardío

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EASTERN PROVINCES (ATLANTIC) OF CANADA
# POTATO PRODUCTION IN CANADA

<table>
<thead>
<tr>
<th>PROVINCE</th>
<th>Area (km²) x1000</th>
<th>Ha potato x1000</th>
<th>Production (Tons) x1000</th>
<th>Yield (Ton/ha)</th>
<th>Seed (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALBERTA</td>
<td>642</td>
<td>22.1</td>
<td>853.6</td>
<td>33.8</td>
<td>3,443</td>
</tr>
<tr>
<td>MANITOBA</td>
<td>554</td>
<td>30.6</td>
<td>941.8</td>
<td>30.8</td>
<td>2,450</td>
</tr>
<tr>
<td>NEW BRUNS.</td>
<td>71</td>
<td>21.3</td>
<td>642.9</td>
<td>30.3</td>
<td>4,691</td>
</tr>
<tr>
<td>ONTARIO</td>
<td>918</td>
<td>15.9</td>
<td>340.4</td>
<td>22.0</td>
<td>270</td>
</tr>
<tr>
<td>P.E. ISLAND</td>
<td>6</td>
<td>35.4</td>
<td>1,131.2</td>
<td>31.9</td>
<td>5,467</td>
</tr>
<tr>
<td>QUEBEC</td>
<td>1,365</td>
<td>16.9</td>
<td>496.4</td>
<td>29.3</td>
<td>2,656</td>
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<td>SASKATCH.</td>
<td>592</td>
<td>4.5</td>
<td>138.6</td>
<td>30.8</td>
<td>1,244</td>
</tr>
<tr>
<td>CANADA</td>
<td>9,094</td>
<td>148.7</td>
<td>4,590.3</td>
<td>30.9</td>
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LATE BLIGHT IN CANADA

- The occurrence and severity of LBT in Canada varies a lot according to the province and also to the weather conditions during summer.

- Normally, maritime provinces have more LBT than the provinces in mid-Canada.

- When rains are scarce during summer, farmers applied fungicides 5 to 7 times as a prevention.

- Seed producer farmers usually applied 7 to 10 times as a prevention.
LATE BLIGHT IN CANADA

• During rainy summers, applications can be done weekly. This may occur every 2-3 years.

• Most commonly used products include: Bravo 500 (chlorothalonil), Revus (mandipropamid), Reason (fenemidose), Manzate in several formulations and Ridomil Gold, etc.

• Generally speaking, LBT is not a serious problem to potatoes except during rainy seasons in the Eastern provinces. As an example, in 2011 and 2012 there were few reports on LBT incidence in Quebec.
RESEARCH AND BREEDING

• **EASTERN PROVINCES:**
  - CHARLOTTETOWN, PEI (Federal) mainly research
  - FREDERICTON, NB (Federal), mainly variety development, genebank, quarantine introduction center
  - CRLB, QC (PROVINCIAL), mainly breeding
  - PROGEST 2001, QC (PRIVATE), breeding, variety evaluation and fungicide trials

• **MOST COMMON VARIETIES:**
  - RUSSET BURBANK ➔ S to LBT
  - GOLDRUSH ➔ S to LBT
  - FRITO LAY ➔ S TO LBT
  - CHIEFTAIN ➔+ MR to LBT
  - SUPERIOR ➔ S to LBT
  - NORLAND ➔ S to LBT
  - ENVOL ➔ S to LBT
  - AC CHALEUR ➔ S to LBT
  - YUKON GOLD ➔ MR to LBT
REMARKS: Despite that most varieties are susceptible to LBT, in Canada alone, potato production represents an annual market value of $1 billion at the farm gate, and a larger market value of $5.5 billion to the food processing industry.
THE PATHOGEN

• In the Eastern Provinces the population races have been as follows:
  – US-8 detected in 1990 (A2 mating type) - Prevalent until 2011
  – Surveys in 2011 determined that prevalent races were US-23 and US-24, although US-8 still found
  – Surveys in 2012 indicated that US-23 is the prevalent race

• Recently, in Alberta and Ontario new races US-11 and US-22 have been detected

• In the Pacific Coast (British Columbia) race CA-12 have been found

• A1 and A2 mating types are present in Canada.

• Evidence for recombination in the *P. Infestans* population have been detected in some provinces in tomato. Segregation of Gpi allozymes and mating type appeared to occur independently of the RG57 loci, producing severe new *P. Infestans* genotypes.
THE PATHOGEN

- A research group at McGill University (Montreal) headed by Dr. A. Kushalappa is actively working with molecular genetic tools to develop CISGENIC potato plants with resistances to LBT.

- In the Eastern Provinces, main sources of initial inoculum are infected tomato seedlings arriving in early spring from USA, volunteer plants and also cull piles left in the fields. In 2015, PEI Agriculture and Agri-Food Canada distributed more than 15,000 packets of seeds from resistant tomato varieties to nurseries and farmers..... almost no reports of LBT on potatoes.
LATE BLIGHT RESEARCH IN QUEBEC

PROGEST 2001

• Progest is a private R & D institution that provides technical support to the potato industry of Quebec. Since 2007, Progest has its own breeding program.

• Among some of the research projects, Progest evaluates potential fungicides for the chemical companies. For this task, we inoculate plants with US-23 and depending on the weather conditions we applied overhead irrigation during the first 48h.
  — In 2014 we had a very dry and warm summer and LBT did not develop until late in the season
  — In 2015 we had a very rainy season and LBT developed perfectly

• Progest also provides the same service to CRLB (Centre de Recherche les Buissons), evaluating for LBT their advanced genetic lines from their breeding program
During 2014 and 2015 Progest put special efforts in crossing varieties known to have some resistance to LBT, such Defender, Patagonia, C-88, etc. and expands its gene pool by crossing with best varieties from Peru, Ecuador, Colombia, Argentina and India.

Progest also has some collaborative research projects with some local institutions.
- McGill University (Dr. Kushlappa) for the development and evaluation of resistant varieties to LBT-CISGENIC
LATE BLIGHT TRIAL IN 2014
LATE BLIGHT TRIAL IN 2015
PROGEST acknowledge the support of CRLB for making possible attending this LBT Taller

• THANKS FOR YOUR ATTENTION