Analysis of historical climate data for Ireland and its impact on Late Blight of potatoes

Joan de Lacey, Eoin Lettice
Potato Late Blight

Virulent resistant pathogen *Phytophthora infestans*

Environmental Cost
15-20 Fungicide applications

Economic Cost
€1 Billion in EU

Effect of +2°C on blight risk
4th Crop Worldwide Acreage increasing

... threat to global food security.
Bourke’s Irish Rules (revised)

- LEAD IN TIME: 12 Hours
  - RH > 90%
  - T > 10°C

- RAIN AT END OF LEAD IN TIME +/- 3 hrs

- No RAIN

- EBH ACCUMULATE AFTER 12 hrs
  - GAP <= 5 hrs
    - EBH CONTINUE
  - GAP > 5 hrs
    - EBH STOP

- EBH >= 12
  - BLIGHT WARNING

... sporangia release, germination, infection.

Annual blight risk
Low risk – Midlands
High risk - South Coast
Accumulated Effective Blight Hours 2010 – 2012 (de Lacey, 2014)
Coastal fog, mainland adjacent to Sherkin Island

... high humidity, blight favourable conditions.
Effective Blight Hours 1981 - 2016

...extending Keane’s work of 1957 – 1981
Application 1: Backyard growers

Case study - 2009 US Pandemic tomato blight

New York State cases of blight Jun to Aug 2009.

“**You say tomato I say agricultural disaster**”

New York Times 17 July 2009

...reduce the severity of blight outbreaks.
Application 2: BlightLink
Inform the roll out of BlightLink

Best Practice
Resistant Varieties
Flow of information

Blight Outbreaks
Real-time
Users upload photos of blight

Blight Warning
Prospective
Blight risk algorithm

...reduce fungicide use in low risk regions.
Application 3: Climate change

Analysis of the impact of climate change on blight risk

A Warmer World Will Mean More Pests and Pathogens for Crops

Diseases like the potato blight have ruined harvests in the past — and still haunt farmers today. Research suggests climate change will spread those pests and pathogens.

By Bryan Walsh @bryannwalsh | Sept. 02, 2013

... benchmark for future monitoring.