EuroBlight industry view

Tizon Latino 24 August 2016

28.07.2016 – Albert Schirring, Roel Wanningen, Christoph Braun, Sylvain Tafforeau
Agenda

- Industry View EuroBlight
- EuroBlight activities
- EuroBlight achievements
- EuroBlight an inspiration for other regions
EuroBlight Industry view

Phytophthora infestans a challenging pathogen

- Phenotypes / isolates with modified epidemiology / pathogenesis
- Potential shift in fungicide sensitivity
- Introduction of new Rphi – genes
- Establishment / co-existence of A1 and A2 mating type

Regulatory / EU legislation

- Reduction of the number of Active ingredients
- Reduction in the application of multi – site fungicides
- Delayed and limited registration of new modes of action

Resource limitation across Research institutions and industry partners

Research and industry partners need a platform to jointly develop and maintain effective management programs to control Phytophthora infestans
A high quality harvest – A GIVEN??
It is not difficult to find *Phytophthora* infected stems and tips in commercial fields across Europe.
Phytophthora infestans - tuber blight
EuroBlight subgroups

EuroBlight works along 5 subgroups:

1. Host resistance to *Phytophthora infestans*
2. Pathogen characteristics, population biology and genetics
3. Epidemiology, integrated control and decision support systems (DSS)
4. Fungicides – efficacy, positioning and application timing
5. Epidemiology and control of Alternaria species

The EuroBlight platform is managed by a multidisciplinary TEAM:

- Aarhus University, Denmark - Dr. Jens G. Hansen
- James Hutton Institute, UK - Dr. Alison Lees
- Wageningen UR –PRI - Dr. Huub Schepers
EuroBlight platform

- An unique platform having fundamental research and various disciplines at the table to jointly conduct research and development as input to optimize the implementation of sustainable management strategy for late blight control

- Common view, using joint protocols for genotyping and biological efficacy trials

- Consistency of biological performance is challenged by using at minimum 2 years of 3 trials; ‘ring testing’ at 3 different locations in the UK, Netherlands, Denmark

- A win-win partnership for all participants
  - Science based research
  - A platform to identify research needs
  - A platform to identity business opportunities

EuroBlight a best in class example of a multi-layered industry – governmental research partnership
Distribution of genotypes
From 2005 to 2008 A2-Blue13 rocketed to 78% frequency.
In 2011 A1-Pink6 became the dominant strain in record time.
Blue13 and Pink6 can sporulate at 6°C; a great head-start over conventional strains.
Pink6 has >50% sporulating potential than Blue13.
Any strain likely to outcompete Blue and Pink will need either:
- High sporulation rates
- High spore survival
- Ability to overwinter in tubers
Clarification dominance of A2 blue 13 in EU

Survives storage (overwinter) and infects early

- A shorter latent period – lesions develop earlier, shorter disease cycle and more cycles per season
- Great aggressiveness – giving bigger lesions
- Develops at lower temperatures – sporulation earlier

- Aggressive even at 13°C
- Able to overcome previously resistant cultivars
- Metalaxyl resistant

Source: Dr Alison Lees, James Hutton Institute, UK
Identification of Alternative hosts

Host of Phytophthora infestans

Solanum tuberosum (potato)
S. lycopersicum (tomato)

- S. nigrum (black nightshade)
- **S. physalifolium (hairy night shade)**
- S. dulcamara (bittersweet night shade)
- S. sisymbrifolium (sticky night shade)
- S. scabrum (huckleberry)
Increased virulence on potato cultivars of both A1 and A2 mating types

**Virulence of genotype 8 - A1**

- R1
- R2
- R3
- R4
- R5
- R6
- R7
- R8
- R10
- R11

**Virulence of genotype 13 - A2**

- R1
- R2
- R3
- R4
- R5
- R6
- R7
- R8
- R10
- R11

**Race:** 1, 2, 3, 4, 5, 6, 7, 10, 11

*Source:* Dr. Alison Lees – James Hutton Institute 2008
# EuroBlight fungicide rating table

<table>
<thead>
<tr>
<th>Product (Dose rate [litre or kg/ha])</th>
<th>Leaf blight</th>
<th>Tuber blight</th>
<th>New growth</th>
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<th>Protectant</th>
<th>Curative</th>
<th>Antifungal</th>
<th>Rainfastness</th>
<th>Mobility</th>
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<sup>1</sup> Includes maneb, mancozeb, propineb and mebasic.  
<sup>2</sup> See proceedings for comments on phenylamide resistance.  
<sup>3</sup> Based on EuroBlight field trials 2009-2012.  
<sup>4</sup> Based on EuroBlight field trials 2009-2012.  
<sup>5</sup> Based on limited data.  
<sup>6</sup> In some trials there were indications that the rating was 2½.  
<sup>7</sup> A provisional rating based on 5 EuroBlight experiments.

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*version 03.06.2016*
## EuroBlight fungicide rating table

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Source: [http://euroblight.net/control-strategies/late-blight-fungicide-table/](http://euroblight.net/control-strategies/late-blight-fungicide-table/)
EuroBlight results (1)
Summary Integrated Control strategy *Phytophthora*

- Prevent the primary inoculum (use healthy seed, volunteers / dumps)
- Use resistant cultivars with different resistance sources (Rphi1-11)
- Implement fungicide strategy according to crop characteristics and adapted to weather (temp, humidity) and disease pressure
- Implement resistance management for fungicides
EuroBlight results (2)
Communication Integrated Control strategy *Phytophthora infestans*
The Euroblight network provided science based data to improve our understanding of the new Phytophthora infestans genotypes

The A2 mating type arrived in the EU in 1980’s (Mexico sourced)
The A2 and the new hybrids changed the epidemiology
- shorter life cycle of the fungus
- increased fungal aggressiveness
- infection earlier in the season
- Increased frequency with stem *Phytophthora*

Increased levels of metalaxyl resistance in *Phytophthora*

Farmers adapted spray programmes: shorter application intervals and use of metalaxyl based fungicides restricted
EuroBlight results (4)

**Alternaria solani** – increased importance in Europe

- Working group established with representatives of industry and research institutions (Technical University of Munich)
- *Alternaria solani* mapping implemented: definition of thresholds for fungicide application
- Fungicide resistance monitoring ongoing (QoI – resistance)
- Fungicide evaluation / performance based on joint protocol in 2015
- EU field trials (DK, Ger, NL) implemented for the year 2016
Next steps

Establish similar **working groups in Asia and LATAM**

Liaise with **EUROBLIGHT Research network**

(e.g. James Hutton Institute, Aarhuus University, BioForsk, Technical University of Munich, Wageningen University and Research)

**Intensify** population **sampling using the FTA cards** to improve understanding on population dynamics and virulence genes to protect new potato varieties

**Attend the Euroblight** meetings to share, utilize and explore synergies with existing research groups

**Euroblight 2.0 (April 2016)** implementation of new Decision support system to reflect the new features of the Phytophthora isolates (germination, leafwetness periods (Smith period))

*Bayer CropScience is committed to further support new initiatives*
The symbol of a global network of networks

USA & Canada
"US Blight"

Central and South America
‘Tizon Latino’

Asia Blight

Africa
A high quality harvest? Possibly Yes...

Based on integrated crop management and in depth understanding of effective and sustainable Phytophthora control