EuroBlight
A potato late blight network for Europe

Statements from the 15th EuroBlight Workshop

Brasov, Romania 10-13 May 2015

'Designing sustainable management strategies for early and late blight in potato'

Coordinators: Jens G. Hansen, Alison Lees and Huub Schepers 25 June 2015

Potato late blight (*Phytophthora infestans*) and Early blight (*Alternaria* spp.) continue to severely damage both the foliage and tubers of potato crops, and also to cause severe losses in other important food crops, such as tomato.

Despite active research and recent breakthroughs, further investigations are still needed to fully achieve integrated pest management (IPM) strategies. Remaining questions include: what are the genotypic (DNA) and phenotypic (behavioural) diversity and the mechanisms of evolution of the European meta-population of *P. infestans?* how can we use this information to develop new innovative and more effective IPM strategies (IPM2.0)? why are these diseases so difficult to control sustainably? how can we sustain the use of both efficient fungicide active ingredients and host resistance genes whilst simultaneously minimising the risk that the pathogen overcomes the efficacy of these important control measures? These, and other, questions were the rationale for establishing 'EuroBlight', a network of European scientists, with initial funding by the European Union.

What is Euroblight?

EuroBlight is a very active consortium of scientists and industry representatives, which has met regularly since 2006 with a simple overall objective: to identify, evaluate and combine the best possible tools to predict, manage and control blight diseases in the field. EuroBlight is a unique collaborative platform to tackle the challenges that early and late blights pose in Europe and worldwide. Its biennial workshops allow key research and extension priorities to be identified and formulated into collective Statements that can serve as the core principles of joint actions and international collaborations to improve IPM strategies.

The 15th EuroBlight Workshop, held in Brasov, Romania in May 2015, brought together over 100 participants from all parts of Europe, South America, USA, Israel and China to achieve this aim.

Major achievements and breakthroughs on past EuroBlight statements

The European-wide monitoring initiative of *P. infestans* populations carried out by EuroBlight partners in 2013 and 2014 (> 2200 isolates collected and genotyped using SSR markers) confirmed that the populations are constantly evolving and that some of them are subject to repeated biological invasions by novel genotypes (read news story about this). Such genetic changes may jeopardize the ability to develop durably resistant cultivars and the sustainability of other control measures. It is thus essential to understand the mechanisms behind the changes and also to their relation to human intervention (e.g. pathogen transportation with plant material or cropping practice) and to the changing climate.

Together with the comprehensive web-based resource developed within EuroBlight i.e. hosting harmonized research protocols and extensive databases allowing the compilation and sharing of data on pathogen populations, host resistance and fungicide characteristics, the research and extension efforts carried out within the network pave the way for the set-up and adoption of 'smart control', IPM strategies for early and late blight in Europe.

Major issues of relevance to policy making in Europe

The recent Europe-wide late blight monitoring initiative demonstrated the value and necessity of constant monitoring of populations and characterization of invasive genotypes in order to understand and predict changes. It directly influences the development and deployment of resistant cultivars, the performance of disease warning systems and the efficacy of plant protection products. A coordinated and continuous monitoring effort would be best supported through National Action Plans relating to IPM implementation in EU member states.

Statement 1: Monitoring of populations of major pathogens and pests

EuroBlight strongly recommends that pan-European population surveillance and monitoring using harmonized protocols, shared methodologies and integrated databases to store and exploit the data in real time should be a core activity in the C-IPM ERA-NET. EuroBlight offers to serve as a pilot network to test the practicality of such an initiative – that might be used as a template and inspiration for similar work on other pathosystems.

Developing IPM strategies compliant with the Directive should rely on the use of optimal combinations of all best local practices. These strategies must take advantage of the population monitoring efforts described above to improve and adapt Decision Support Systems, which remain central for the optimal deployment of cultivars and plant protection products. This requires an association between pathogen genotypes (increasingly accessible in terms of methods and costs) and pathogen phenotypes. This remains a challenge that requires further cooperative research.

Statement 2: Linking genotypes to phenotypes

EuroBlight recommends that the challenge of linking genotypes and phenotypes in *P. infestans* is explicitly included as a topic for collaborative research projects within the frame of H2020, and is willing to build and lead such a project. EuroBlight also recommends that this information be used widely to develop and support pre-breeding activities to select more durably resistant potato cultivars.

The prediction of infection risk is a key element of IPM. EuroBlight has developed a Web platform for testing, comparing and sharing of sub-models that can be incorporated in Decision Support Systems for late blight forecasting. Additionally, EuroBlight has developed platforms and collaborative workspaces (including databases, protocol repositories, and analytical tools), which are strategic assets in meeting the challenges posed by the sustainable management of late blight.

Statement 3: EuroBlight engages in the development and improvement of DSS adapted to IPM2.0

EuroBlight commits to the development of improved DSS models, with i) a better prediction of early infection and ii) more explicit use of pathogen phenotype and genotype data for improved accuracy of risk evaluation and management recommendations. EuroBlight expresses its concerns regarding effects of the EU regulatory framework for crop protection on the availability of fungicides to control Late Blight in an integrated way.

The value and portability of the tools and platforms developed by EuroBlight were highlighted by the leaders of similar networks now getting established in other parts of the world: USA (USABlight), Latin America (Tizon Latino) and Asia (AsiaBlight). Given the intensive intercontinental trade in potato and tomato, and the possibility for worldwide dissemination of invasive genotypes, it is essential that these networks cooperate (read news story about this).

Statement 4: fostering international collaboration

EuroBlight offers to contribute its tools and platforms to establish these new networks. It will also take steps to transfer them for the implementation of similar networks on other major agricultural pests of important food crops.

Contact

Contact one of the co-ordinators of EuroBlight:

Alison Lees, alison.lees@hutton.ac.uk
Jens G. Hansen, jensg.hansen@agro.au.dk
Huub Schepers, huub.schepers@wur.nl