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EU Action Plan

EU potato production at risk: a call to combat late blight in potatoes

Introduction

Potato late blight (*Phytophthora infestans*) is the most destructive disease of potato and responsible for the Irish Famine in the 19th century. Annual economic damage in the EU is estimated at around 900 million EUR¹.

The pathogen infects both foliage and tubers and can destroy the complete crop within 1-2 weeks. In addition, the pathogen is highly adaptive and able to quickly develop resistance to fungicides and break resistance genes (R-genes).

Recently, the pathogen population has been developing more complex virulence spectra (i.e. the ability to break more and more combinations of R-genes) and the development of combined resistance to single-site fungicide active ingredients. These developments are reducing the number of effective control tools, potentially to such a low level that current Integrated Pest Management (IPM) control strategies in the future will no longer be effective².

Forward-looking Integrated Pest Management (IPM) control strategies are feasible by combining the current control strategy with the introduction of more resistant potato varieties, farm management practices against infection and the availability of fungicides with a range of "mode of actions" for both resistance genes and fungicide active ingredients complementing and protecting each other.

Late blight threatens European potato production, the potato supply chain, and the positive EU trade balance!

New and overly aggressive strains of late blight in potatoes (*Phytophthora infestans*) are spreading fast. In addition, they are developing resistance towards the single site fungicides commonly used for blight control across the EU. Fungicides with a multisite mode of action are no longer available for use by EU potato growers. Currently, resistance has been detected in four out of eleven major fungicide modes of action. As

¹ **Societal Costs of Late Blight in Potato and Prospects of Durable Resistance Through Cisgenic Modification**, A. J. Haverkort & Co, Potato Research (2008), Published online: 28 June 2008

² **Development and validation of IPM strategies for the cultivation of cisgenically modified late blight resistant potato**, Geert J.T. Kessel & Co, European Journal of Agronomy, 2018,146-155



a result, the remaining modes of action are under increased and serious pressure. It is anticipated that the emergence of resistance to the remaining modes of action will evolve over the coming seasons.

Also, some genetic resistances in potatoes have been broken down in field crops, endangering an essential cornerstone of integrated crop management. The future of potato production in Europe is threatened for all types of production, whether conventional, organic, or home gardeners. Safeguarding crop health and product quality is the cornerstone of all farming activities, irrespective of the production method.

Potato late blight is already a scourge for the 2024 growing season with the potato sector in desperate need of both short-term and long-term solutions, including both in terms of research and application.

It is vital to inform the European Commission, the European Parliament, and the Member States about the **seriousness of the situation and the urgent need for coordinated action, including the need for rolling out appropriate policies and resources from the European Commission and Member States.**

A European Action Plan to combat late blight in potatoes is needed!

The action plan will aim to:

- **raise awareness** of the need to tackle this problem among national and European public authorities and stakeholders in the potato value chain.
- **develop concrete measures in close collaboration with the European Commission, Member States, and stakeholders.**
- **recognise the need for safe, effective, and sufficient tools to control late blight where the combination of improved resistant varieties and well monitored crop protection is the forward-looking integrated strategy, alongside robust anti-resistance strategies** for fungicides to combat aggressive *Phytophthora* strains so that farmers can work towards ensuring food security and feed the world's growing population.
- **prioritise the provision of coherent and systemic information.** Providing information and advice available to EU farmers must be a priority to secure the implementation of effective control strategies based on the adoption of the latest R&D findings on the population dynamics of *Phytophthora infestans*. Resistant varieties with improved resistance as well as preventive and effective resistance management strategies of fungicides should be used.

The action plan should include:

Short-term measures



- Creating a stakeholder dialogue platform to discuss strategies on combatting potato late blight and collaborating with the existing scientific research groups and networks such as the EuroBlight³.
- Equipping the farmers' toolbox sufficiently:
 - Monitoring of *Phytophthora* isolates must be rapid to apply the right crop protection strategy.
 - The existing fungicides should be retested for efficacy against new strains of late blight through multi-year extended tests as new strains are appearing every year.
 - Fungicides with five different modes of action must be made available to farmers. The mode of action of the different fungicides should be clearly identified by farmers (synoptic table).
 - Currently available fungicides should not be banned nor restricted without a proper risk/benefit analysis, and unless a similar effective, sustainable, and affordable alternative, with at least the same level of efficacy, is available on the market. Fungicides supporting a minimum of five highly efficient modes of action should be maintained to ensure effective fungicide resistance management by farmers.
 - Communicating on Integrated Pest Management (IPM) to farmers, including preventive strategies to prevent the breakdown of resistance genes against late blight based on scientific results and models as well as FRAC⁴ guidelines.
 - Using effective, validated, and efficient on-farm Decision Support Systems (DSS) including flexible spray recommendations for interval and dose rates depending on disease pressure.
- Short-term measures in detail:
 - Promote best agricultural management practices:
 - preventive measures such as crop rotation and the effective control of *Phytophthora* inoculum (volunteer potatoes, waste piles, oospores). The first step in an integrated control strategy for late blight is reducing the primary sources of inoculum, e.g. to cover dumps with black plastic to reduce the release of spores onto subsequent crops and to control volunteer potatoes.
 - crop protection: adjust the choice of fungicide used to the crop stage, disease pressure and weather conditions and, ensure the use of mixtures, alternating fungicides with different modes of action used at their full rate as recommended by the supplier to avoid selection of resistant strains, for example: "The Color scheme for testing pesticide use on *Phytophthora*" in the Netherlands⁵.
- Develop a harmonised availability of tools and ensure collaboration between Member State authorities to avoid having differences in available solutions across Member States to suppress selection and the spread of resistant strains.
- Highlighting how late blight resistant potato varieties are one important key to any solution. Now, the resistant varieties mostly contain a single resistance gene (R-

³ <https://agro.au.dk/forskning/internationale-platforme/euroblight/about-euroblight>

⁴ <https://www.frac.info/>

⁵ <https://www.bo-akkerbouw.nl/nieuws/kleurenschema-voor-toets-middelengebruik-phytophthora/>.



gene), which is highly likely to be circumvented. The long-term objective is to edit different genes to reduce the risk of circumvention of resistance genes as much as possible and obtain sustainable late blight resistance varieties. Therefore, conventional breeding with the support of marker-assisted selection needs to continue.

- Raise awareness among distributors and value chain partners about the need to promote planting different available late blight-resistant potato varieties.

Mid-term measures

- Monitoring *Phytophthora infestans* populations.
- Developing a coordinated approach from the crop protection sector and breeders. The most effective way to control the spread of late blight is the combined use of effective plant protection products and resistant potato varieties with combinations of different resistance genes.
- Developing new and effective solutions with the ability to control foliar and tuber blight.
- Breeding:
 - Establish systemic and extended monitoring program-including a feedback-system for potato-breeders in the case of late blight infecting improved resistant varieties. An early detection of new types of late blight bypassing new genetic resistances can help to avoid uncontrolled outbreaks of late blight.
 - Only a few varieties are highly resistant to late blight. New and more highly blight resistant potato varieties would be a fundamental solution for farmers. Both traditional marker-assisted breeding as well as New Genomic Techniques (NGTs) are a supportive tool to develop additional resistant varieties, NGTs must be therefore approved as soon as possible.

Stakeholder commitments

- Partnership - Involve farmers, scientists and industry with EU and national competent authorities.
- Ensuring that effective conventional crop protection and biocontrol products, decision support systems and new improved potato varieties continue to be made available for farmers in the EU.
- Provide information for all stakeholders on the cycle of *Phytophthora infestans* and its susceptibility to the different modes of action of fungicides and of resilient improved late blight resistant varieties (R genes/vertical resistance).
- Collaborating in the supply chain to convey consistent messages about integrated *Phytophthora* management to growers and advisors.

Calls for policies to the European Commission and the Member States:



- Communicate on the importance and benefits of potatoes in a balanced diet, thereby securing EU potato production by combatting late blight in potatoes, including the establishment of an early warning system for the spread of late blight and resistance to fungicides.
- Support the continuous availability of existing late blight fungicides and consider their benefits when reviewing their approvals.
- Maintain conventional solutions in the overall search for alternative solutions.
- Support further development of breeding techniques for improved disease resistance including for both conventional as well as NGTs.
- Support from authorities to help bridge the gap between researchers and farmers and to find widely shared solutions that would ultimately be perceived as new feasible opportunities for farmers to improve productivity. Drive the political discussion on NGTs and bring the file to a quick and future-oriented conclusion.
- Establish a faster and less burdensome approval procedure for effective plant health solutions.
- Make funds available for fundamental and agronomic research projects and knowledge transfers to combat late blight in potatoes. Set up an EIP-AGRI Operational Group project on potato late blight with concrete actions to share knowledge and research results in each relevant Member State.
- Develop effective, tailor-made Integrated Pest Management strategies.
- Promote chemical solutions with a lower environmental impact as part of the search for alternative solutions.

Background

Potatoes are cultivated on 1.7 % of the EU's arable land, totalling about 1.7 million hectares in the EU. The EU is a net exporter of potatoes, mainly seed potatoes, with a value of 509 million EUR (2020). Beside of fresh consumption, potatoes are processed to be turned into four main types of products: frozen potatoes, dried potatoes, prepared or preserved potatoes, and potato starch. The overall value of EU processed potato production reached 9.1 billion EUR in 2019, equalling 1.6 % of the value of production of the whole European food industry. Frozen chips and crisps were the most significant processed products in terms of production value. The EU is also a net exporter of processed potatoes, this standing at a value of 3 billion EUR in 2022.

Around 1.5 million agricultural holdings in the EU grow potatoes. The value of raw potatoes (including seed potatoes) represents about 3% of the EU's total agricultural output. For many agricultural holdings, potatoes are a break crop in rotation with cereals (source: Eurostat⁶).

⁶ https://ec.europa.eu/eurostat/statistics-explained/index.php?title=The_EU_potato_sector_-_statistics_on_production,_prices_and_trade#Values_and_prices