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## Early detection of *Phytophthora* in EU and third country nurseries and traded plants

Invasive species cause significant economic damage to agricultural, horticultural and forestry crops worldwide, as well as ecological damage to native plant species in wider environments. Phytophthoras are well adapted to living in plant nurseries, particularly in water, soil and plant roots. Traded plants for planting are a well-documented pathway for *Phytophthora* pathogens, facilitating their spread both nationally and internationally.


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**The goal of the ID-PHYT project was to develop knowledge on nursery surveillance and management methods for *Phytophthora* species and increase awareness of the risks of Phytophthoras in the horticultural sector.**

During the project, 1011 pooled samples (647 root samples and 364 water samples) were collected from 13 plant nurseries across 6 countries (FR, GB, GR, IE, IT, US) and analysed using common and validated baiting or metabarcoding protocols. A high diversity of *Phytophthora* (65 known *Phytophthora* species including quarantine-regulated species and some first country records) was detected across the 13 sampled nurseries. *Phytophthora* was found in the irrigation water at several of the nurseries highlighting water management as a key priority area for improvement.

High risk hosts with consistent *Phytophthora* associations included *Fagus*, *Ligustrum*, *Thuja*, *Lavandula*, *Quercus* and *Choisya* spp..
Other nursery risk factors which increased the likelihood of *Phytophthora*-positive samples included reliance on greater than 50% imported plant stock and growing a high diversity of plant genera. Correlation was also investigated between different substrates (water versus root), nursery latitudes and the likelihood of *Phytophthora*-positive samples. This knowledge can assist in understanding the biology and epidemiology of *Phytophthora* species, and support risk assessment.

Stakeholder mapping and a subsequent online stakeholder survey were organized to gain insight into sector perceptions on biosecurity and how to shape best practice guidance for nurseries.

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# Success story

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The stakeholder survey elicited 97 responses from individuals in a range of roles associated with the plant trade across eight countries. Respondents listed over 100 different pests of concern, with *Phytophthora* species and *Xylella fastidiosa* being most frequently cited.
Boot washing, quarantining plants and training staff in plant health were seen as important biosecurity management practices although biosecurity practices in general were perceived as being ineffective in reducing the impact of pests in trade. Communicating how biosecurity practices can and do reduce the risk and impact of plant pests may increase implementation of important phytosanitary measures by the sector. For example, there was evidence during the project of partner nurseries changing their practices as a result of project engagement. One of the nurseries in the United Kingdom, upon realising that their open irrigation reservoir was contaminated with eight different *Phytophthora* species, subsequently invested in sinking a borehole to access clean groundwater for irrigation.

Best-practice guidance was designed and disseminated through each country's trade association channels. The best practice guidance highlights the key plant biosecurity considerations for growers and focuses on the need to understand high risk hosts and pathways, improved water management and plant growing conditions, awareness of symptoms and the importance of having staff trained in plant health.

The results of the project contributed to the development of a co-ordinated strategy for early detection of *Phytophthora* in plant nurseries and traded plants for planting and will inform best practice, complement phytosanitary regulation and enhance engagement in plant health with growers and traders operating in different countries.

Project ID: Early detection of *Phytophthora* in EU and third country nurseries and traded plants (ID-PHYT)