



Phyto-Threats: nursery sampling for *Phytophthora*

Britain's natural and managed environments are under increasing threat from a broad range of plant-pathogenic phytophthoras existing in many different parts of the world. These microscopic invaders are being brought into Britain and spread around the country in soil, water and tissues of a large number of plant species. This is damaging our plant industry AND our well-loved ecosystems.

We are working with industry to ensure healthy, high value plants

Fifteen partner nurseries are being sampled for *Phytophthora* twice a year over a three year period by the Phyto-Threats project team. Based on analyses of DNA present in the samples, we are identifying which phytophthoras occur and where in our nursery and retail production systems. The data we provide are helping businesses to manage their *Phytophthora* risk.



Water sampling

At each nursery we are sampling irrigation water at source as well as water from puddles, drainage ditches, collection ponds and streams running alongside nurseries. Batches of plants are also watered to flush out *Phytophthora* spores and the water flow-through is sampled.

Root sampling

We sample roots from plants which may have symptoms of *Phytophthora* infection or which are known *Phytophthora* hosts. Roots are also sampled from plant dumps, plant "hospital" areas and other discards.





Messages so far...

- Water management is a key factor in minimizing *Phytophthora* risk – cover storage tanks to prevent contamination of precious borehole and mains water.
- River extraction can be risky due to potentially high *Phytophthora* loads.
- Open reservoirs also prone to *Phytophthora* contamination.
- Water treatment/filtration options are advisable to control *Phytophthora*.
- Puddles can harbour many phytophthoras – good drainage is key.
- Evidence for *Phytophthora* root infections in newly arrived imports from EU.
- Infected nursery shelterbelt/landscape trees can harbour *Phytophthora*.

Project goals

The project is using these data to address the risks to UK forest and woodland ecosystems from *Phytophthora* and also to provide the scientific evidence to support nursery 'best practice' accreditation criteria to mitigate the risk of further *Phytophthora* introduction and spread.

Preliminary findings to date

- Nurseries use a range of water sources; mains, borehole, open storage reservoirs, river water and rain water (treated and untreated).
- In one case mains water stored in an uncovered tank contained two *Phytophthora* species.
- One borehole sample also contained two *Phytophthora* species.
- Storage reservoirs and ponds found in cases to contain *Phytophthora* species not yet recorded as present in the UK.
- One rainwater sample contained three *Phytophthora* species and one river water sample contained eight *Phytophthora* species.
- But the record goes to the puddle water; a single puddle was found to contain 11 different *Phytophthora* species!
- Two aggressive *Phytophthora* pathogens detected in root samples from plants straight off a lorry from the EU.
- Nursery shelterbelt trees and mature trees planted on site also found to harbour *Phytophthora* infections.

The Phyto-Threats Project is a Living With Environmental Change project for the Tree Health & Plant Biosecurity Initiative (THAPBI). It will address knowledge gaps identified by Defra's Tree Health and Plant Biosecurity Expert Task Force and the objectives of the joint Defra/Forestry Commission Tree Health and Plant Biosecurity Action Plan. More information about the project can be found on the project website www.forestry.gov.uk/fr/phytothreats

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