



## Symptoms of Ill Health in Plants: An Introductory Guide for the Horticultural Sector

Invasive plant pests and pathogens are having increasing impacts on UK landscapes, often due to being spread by infested planting material via trade pathways. These risks can be mitigated by ensuring that only healthy stock is grown and planted.

This guidance aims to help the professional operators responsible for growing or handling live plants to identify and act upon symptoms of ill health. A key purpose is to avert potential new pest and pathogen outbreaks that can damage horticultural businesses, trade and wider landscapes.

### Symptom awareness

#### Know what a healthy plant should look like

Know what the habit and healthy colour of each plant species that is grown and handled should look like, so that malformed or 'off-colour' plants can be identified and assessed. It is also essential to know the main pests and pathogens affecting the plant species grown or handled, as well as the typical symptoms to look out for.

#### Build your plant health knowledge

Every nursery or horticultural site should have at least one staff member trained in plant health and symptom awareness.

#### Monitor stock regularly

A plant health 'crop walk' should be carried out across the entire nursery or horticultural site on a regular basis. Action should be taken to confirm the presence of suspected pests and pathogens and deal with symptomatic stock. This action includes the isolation of symptomatic plants away from remaining stock and seeking an accurate diagnosis of the cause from a diagnostics lab (see below). If the pest or pathogen is suspected to be notifiable then immediate contact should be made with the relevant plant health authority (see below).

#### Diagnose the cause

Organisations such as Forest Research (in case of tree nurseries) and the Royal Horticultural Society offer diagnostic services to growers. APHA and SASA are the competent plant health authorities and will investigate concerns around statutory pests and pathogens. A correct diagnosis is crucial to effective control.

## Generic symptoms indicative of pathogen infection

All symptoms of foliage discoloration or desiccation, however minor, could be indicative of infection and should be assessed and dealt with accordingly.

Generic symptoms to look out for include:

All or most of the foliage taking on a paler hue, eventually leading to bronzing. This is symptomatic of root or collar infections by pathogens such as *Phytophthora* which starve the plant of water and nutrients.



Pale and green foliage side by side.

Patches of brown or 'off colour' foliage.



Left: Invasive juniper pathogen *Phytophthora austrocedri* infecting *Leylandii*. Right: *Buxus sempervirens* infected with *Phytophthora occultans*.

Leaves with marginal necrosis may be a symptom of a notifiable pest, such as *Xylella fastidiosa*.

Maintaining plants in poorly drained conditions and directly on soil is likely to lead to root infections. In such cases roots will be blackened and rotting.



Brown-black lesions on leaves and stems



Rhododendron infected with *Phytophthora ramorum*.

## Disposal of unhealthy plants

Sick plants not subject to statutory action should not be dumped on site but should instead be disposed of by incineration (with suitable licences in place) or through a contained composting system - see additional guidance on [plant disposal](#).

## Certification to improve supply chain biosecurity

One way of having confidence in the health of the plants you specify is by choosing a certified supplier who has adopted the Plant Health Management Standard. More details are available at [Plant Healthy](#) or [Fera - Ready to Plant](#).

Strongly consider promoting biosecurity across the supply chain by becoming certified and by sourcing from growers who are scheme members.

## More information

Further details of our work on biosecurity is available at:

[www.forestresearch.gov.uk](http://www.forestresearch.gov.uk)

To discuss any aspect of Forest Research's work on biosecurity threats, contact:

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