



Management of juniper populations to mitigate spread of *Phytophthora austrocedri*

Juniper is threatened by the invasive pathogen *Phytophthora austrocedri*, which is now established at many sites in Scotland and northern England. This root-infecting pathogen has a life cycle well adapted to spreading in water and soil. This risk can be mitigated by following good practice when planting juniper.

Along with other *Phytophthora* species, *P. austrocedri* is frequently detected on juniper and other Cupressaceae hosts in plant nurseries, including on imported plants. As a result, there is a high risk of these pathogens being spread to wider environment sites across the country via planting schemes that use nursery-raised juniper.

This guidance aims to help those responsible for managing juniper populations to follow good practice when considering supplementary or restoration planting.



Juniper infected with P. austrocedri in the Scottish Highlands.

Key considerations for planting juniper

Is the destined planting site an existing juniper population with some natural regeneration present? If so, don't plant and instead improve management for natural regeneration. This is by far the best way of ensuring long-term resilience in the population.

If planting is deemed to be the only option, i.e. where small, declining populations occur or in new woodland creation schemes, then consider the following checklist.

- Sites with poorly drained, moderately acidic soils provide ideal conditions for *P. austrocedri* establishment and spread, and should not be planted.
- Any planted juniper should be raised from genetically diverse local material in a nursery that operates stringent **biosecurity standards** and does not import plants. Inspect the nursery to ensure these standards are being met.
- Planting stock should be 100% visibly healthy (i.e. no browning of foliage) and in bare-root form to avoid transfer of *Phytophthora* pathogens that can exist, unseen, in growing media.
- Avoid planting any nursery-raised juniper within 1 km of an existing juniper population due to elevated risk of vector transmission of *P. austrocedri* in plant debris/soil between the sites (i.e. via deer, sheep or human recreational activity).

- When on-site, **always** ensure that high standards of biosecurity are met: All footwear, tools and equipment should be cleaned **before entering and immediately after leaving** site with water and brush until clear of any presence of soil and plant material then sprayed with a recommended arboricultural disinfectant.
- Monitor trees after planting. Symptoms of foliage browning could be due to *P. austrocedri* infection in the root system and lower stem. Therefore, it is important to test the root/stem/branch phloem for *Phytophthora* rather than the foliage, which is desiccated and will not itself harbour the pathogen. Use **TreeAlert** to confirm any diagnosis.



Foliage browning in young juniper plants indicative of early infection.

Plant Healthy



TreeAlert



Further details of our work



More information

Further details of our work on biosecurity are at:
www.forestresearch.gov.uk/research/global-threats-from-phytophthora-spp

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