DAFM Plant Pest Factsheet

Phytophthora pluvialis



Pest Characteristics

- Pest: Phytophthora pluvialis
- Common name: Red needle cast (RNC) on Pinus radiata in New Zealand
- Hosts: Western hemlock (only in UK), Douglas-fir (UK/USA/NZ); radiata pine (only in NZ) and tanoak (only in USA)
- Invasive Risk: Phytophthora pluvialis is an oomycete pathogen that has been recorded from three geographically distant areas of Pacific Northwest USA, New Zealand, and mainland United Kingdom. Research has shown P. pluvialis is an introduced species in NZ. Recent findings in the UK pose an increased risk of introduction to Ireland. There is also the high possibility that P. pluvilais is more widely distributed than its known distribution, given the detection and impacts of the pathogen are restricted to wintertime during favourable conditions of high rainfall and humidity.
- Entry Pathways: It is uncertain how *P. pluvialis* has moved into new regions, possible pathways are considered to be plants for planting, wood commodities, natural spread or via soil as a contaminant.
- Adaptability: Prospects for establishing in Ireland are favourable.
 Phytophthora pluvialis is a cold temperature Phytophthora with moisture also a key driver of infection and outbreaks. Favourable environmental conditions appear to be comparable to those of Phytophthora ramorum.
- Visual Symptoms: The pathogen had been found to cause dieback on lower branches, which is common across all known hosts and locations affected (Fig 2). While foliar symptoms are characteristic in the USA and NZ, additional symptoms on wood have been reported in the UK (Fig 3).



Fig 2: Visual symptoms of *P. pluvialis* causing lower dieback a) Radiata pine in NZ b) western hemlock in the UK (c) Douglas-fir in western Oregon



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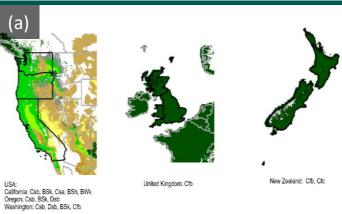




Fig 3: Visual symptoms of *P. pluvialis* on western hemlock in the UK a) multiple resinous cankers b) resinous canker with lesion under bark UK (c) resinous basal cankers

- **Impact:** It is uncertain how severe the pathogen may become in the UK as a full *P. pluvialis* disease cycle has yet to be observed. However, to date, a wider range of symptoms have been observed including canker symptoms and dieback (Fig 3). In NZ, *P. pluvialis* causes red needle cast (RNC) on radiata pine. Disease expression is highly variable (in incidence and severity) and symptoms do not re-occur every year. In many cases, only needles in the lower crown of the trees are symptomatic with new-season needle growth unaffected.
- Dispersal: Rain splash also via soil, streams and wind. Few barriers to prevent spread once established.
- **Distribution:** Known distribution of Pacific Northwest in the USA, North and South island in NZ, with recent outbreak sites in England, Wales and Scotland (Fig 4).
- **Lifecycle:** The current understanding of the lifecycle for *P. pluvialis* is largely based on the general *Phytophthora* lifecycle. *Phytophthora pluvialis* is self-fertile (homothallic). For *P. pluvialis*, zoospores are presumed to be the main dispersal and infection propagule as their sporangia have been described as only partially caducous (i.e. they only detach occasionally).
- **If suspected:** If you find suspected signs and symptoms of *P. pluvialis* please submit images to DAFM at: plantpestreport@agriculture.gov.ie

Photo credits: Fig 2(c) © Everett Hansen; Fig 2(a) © (Dick *et al.*, 2014); Fig 1, Fig 2(b), Fig 3(a)(b)(c) © Forest Research. Fig 4 modified from output of ScanClim tool, EFSA.



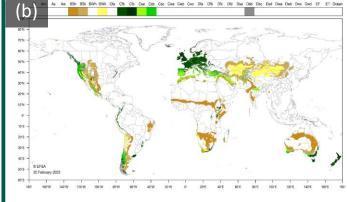


Fig 4: Distribution and climate suitability (a) Countries and regions in black outline where *P. pluvialis* has been recorded and associated Köppen-Geiger climate types (b) Occurrence of these eight Köppen-Geiger BSh, BSk, BWk, Cfb, Csb, Cfc, Csa, Dsb climate types found in the world