

Dothistroma needle blight (DNB)

The disease of pines known as Dothistroma Needle Blight (DNB), or Red Band Needle Blight, is caused by two species of fungi: *Dothistroma septosporum* and *D. pini*. The former is responsible for the current epidemic of DNB and was first found in Britain in a nursery in 1954, but until the late 1990s instances of infection were rare. Initial symptoms include red banding on needles, then affected needles are shed prematurely. If defoliation is extensive and continues year-on-year, trees are weakened, timber yield is reduced and mortality can occur. In Britain, Corsican is the most at threat from this disease, although lodgepole pine can also be seriously affected, and there is now an indefinite moratorium on planting of both species on the Public Forest Estate. More recently stands of Scots pine have also been widely affected by DNB, although generally only in areas where disease levels are already high.



Research evidence has revealed

- From 1997 to 2002, 20 cases of DNB were identified, most occurring in East Anglia. Since then, the disease has been identified in ca. 14,200 ha of Corsican, 2,500ha of lodgepole and 1,100 ha of Scots pine and 200 ha of minor pine species in GB.
- Corsican, lodgepole and Scots pine of all ages appear to be susceptible to infection. In addition, 13 other pine species, Sitka spruce, Norway spruce and Douglas fir have proved to have some susceptibility to DNB, either in arboreta or field trials.
- Drivers of the marked rise in disease levels include increased rainfall in spring and summer, together with warmer springs, optimising conditions for spore dispersal and infection.
- Both mating types of *D. septosporum* are present in Britain; high levels of genetic variation occur in pathogen populations in some areas.
- Although present in Europe, the other DNB pathogen *D. pini* is absent from Britain.
- Silvicultural (thinning, pruning) and chemical treatments can reduce disease levels.

Known evidence gaps

- Detailed understanding of disease epidemiology of DNB under different environmental conditions to aid management decisions.
- Modelling of DNB to assess potential changes under climate change scenarios as well as impact of the disease on carbon sequestration.
- Impact of DNB on timber properties and determination of decay rates of dead and dying trees.
- Susceptibility of alternative species, and host resistance mechanisms to *Dothistroma* needed to underpin future planting strategies of resistant species.
- Development of remote sensing techniques to aid in disease monitoring of DNB.

Potential impact

Pine comprises almost 30% of the conifer growing area of Britain (409,000 ha). Corsican pine alone has biodiversity and carbon sequestration values of £42m/annum, whilst landscape and recreation values exceed £28m/annum. For this species, losses to timber value are estimated to be around £8m/annum, and based on current disease levels, losses to non-timber benefits are around £50m/annum and growing, depending on the impact of the disease on lodgepole and Scots pine.