



Forest Threats

Pine pitch canker and Fusarium wilt

Tree Protection Co-operative Programme

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Fungal diseases

Pine pitch canker and Fusarium wilt

Fusarium circinatum Nirenberg & O'Donnell

SYMPTOMS

Nursery: Wilting; shoot die-back; root and collar rot of seedlings and cuttings (Wingfield et al. 2008; Gordon et al. 2015)

Field: Branch and tip die-back (flagging); resinous cankers form on the branches and stems. In younger trees (3 - 6 years old) cankers will occasionally form at the base of the tree above the soil line and on exposed roots. The pathogen also infects the cones, which become stunted and misshapen (Wingfield et al. 2008; Gordon et al. 2015).

BIOLOGY

Nursery: *Fusarium circinatum* spreads quickly through a nursery via its spores. The spores are produced in sporodochia and are moved with infected plants, wind, rain splash, water, trays and infected tools. When roots come into contact with spores, an infection is likely to occur. When the fungus gains entry, it spreads through the roots into the above ground parts. When the tissue starts to die, the fungus will sporulate and produce new spores that will add to the inoculum in the environment. Infection by the fungus doesn't always produce symptoms and plants can remain asymptomatic until establishment.

Field: In South Africa, post planting mortality caused by *Fusarium circinatum* is a common occurrence. Cuttings/seedlings from nurseries with *F. circinatum* appear asymptomatic until they are planted in field. The change in conditions between the nursery and field place stress on the young trees, which leads to disease caused by *F. circinatum*. Outbreaks in mature trees can be caused by a dormant infection of the pathogen from the nursery or it can be spread between trees and even compartments through its spores carried by wind, water or insects. The spores gain access to the trees through wounds (pruning damage, hail damage, insect wounds, natural openings, etc.). Infected trees become an inoculum source where the fungus will produce more spores.

