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Pathogen of the month – August 2012

Phellinus noxius (Corner) G.H. Cunningham




Fig. 1. Successive death of avocado trees along the row; **Fig. 2**. Infection "stocking" advancing up the trunk; **Fig 3.** Light, dry, friable and honeycombed decayed wood; **Fig 4.** Bracket-type basidiocarp on hoop pine Photos by; Tony Cooke, Liz Dann and Geoff Pegg

Disease: Brown root rot
Classification: K: Eumycota, D: Basidiomycota, C: Agaricomytes, O: Hymenochaetales, F: Hymenochaetaceae

Brown root rot caused by *Phellinus noxius* is a significant fungal disease of hoop pine (*Araucaria cunninghamii*) and avocado (*Persea america*) in northern New South Wales and Queensland. The fungus spreads primarily by root to root contact with airborne basidiospores a potential source for new infection foci.

The Pathogen: In undisturbed rainforest environments, *P. noxius* is an important wood decay and recycling agent, however, where monoculture plantations or orchards have replaced native rainforest, the fungus may infect and cause serious losses to production through tree deaths. In Australia, fungal fruiting bodies from hoop pine were tentatively identified as early as 1952 as the basidiomycete *Fomes noxius* (later reclassified as *Phellinus noxius*), and the identity of later collections confirmed (Bolland 1984). Confirmation of *P. noxius* causing tree death in avocado occurred in 2002 from the Sunshine Coast hinterland in Queensland.

Impact: Overseas, it has caused significant loses in rubber, oil palm, tea, mahogany, teak, cocoa, longan, litchi, pear, persimmon and *Acacia mangium* which has been widely planted in south east Asia for pulpwood production. In Australia brown root rot is a significant problem in hoop pine plantations in Queensland, avocado orchards in the Bundaberg/Childers and Atherton Tablelands areas and in urban amenity trees such as jacaranda and figs in Brisbane and the Gold Coast. The fungus can survive for many years as hyphae in woody debris buried in soil, and thus infect susceptible hosts upon contact.

Host range and distribution: *P. noxius* has a wide host range, infecting more than 200 (mostly woody) species from over fifty plant families. It is widespread among tropical and subtropical regions of southeast Asia, Africa, Oceania, Central America and the Carribean, and Japan. In Australia it has been recorded in Queensland and northern New South Wales.

Detection and control: Key symptoms are diagnostic and may include rapid wilting and death of trees, successive death of trees along the row (Fig 1), presence of brown mycelial crust covering infected roots, also sometimes visible on the trunk above ground (the infection "stocking") with white margin (Fig 2). In advanced decay wood becomes light, friable and honeycombed (Fig 3). Mycelia is commonly cinnamon brown in colour. Fruiting bodies are common in hoop pine in north Queensland (Fig 4) but have not been seen on avocado. Confirmatory diagnosis is currently through sequence analysis of the internal transcribed spacer (ITS) region. Management is limited to removal of the dead tree and immediate neighbours and installation of root barriers to quarantine the affected area. Fungicide infusion and fumigation options are currently being investigated for avocado.

Further Reading: Bolland, L. (1984) Phellinus noxius: cause of a significant root-rot in Queensland hoop pine plantations. Australian Forestry 47:2-10; E. Dann, L. Smith, K. Pegg, M. Grose, G. Pegg (2009) Report on *Phellinus noxius*, the cause of brown root rot in Australian avocados, Talking Avocados, 20 (2): 28-34
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