



Fig. 1. Black root rot symptoms in young orchard transplants (a), necrotic avocado roots (b, c) *Dactylonectria macrodidyma* on ½ sPDA at 3.75 cm after 10 days growth (d, e), *D. macrodidyma* macroconidia at 40 × magnification (f)

Disease: Black root rot of avocado

Name: *Dactylonectria* spp. including *D. macrodidyma*, *D. novozelandica*, *D. pauciseptata* and *D. anthuriicola*

Classification: K: Fungi, D: Ascomycota, C: Sordariomycetes, O: Hypocreales, F: Nectriaceae

Black root rot caused by nectriaceous fungi is a severe disease of avocado nursery trees and young orchard transplants, causing decline and death within one year of planting. Symptoms include stunting, wilt, leaf chlorosis and browning, leaf drop prior to tree death caused by severe necrosis of the root system. In Australia black root rot of avocado is caused by *Calonectria ilicicola* and several *Dactylonectria* spp.

The Pathogen:

Species of *Dactylonectria* (reported as *Cylindrocarpon* in older literature) have often been isolated from necrotic avocado roots. *Dactylonectria macrodidyma* is the most prevalent of the pathogens found in symptomatic avocado roots. *Dactylonectria novozelandica*, *D. pauciseptata* and *D. anthuriicola* have also been isolated from avocado roots and shown to be pathogenic in glasshouse tests with seedlings. While *Dactylonectria* spp. can be isolated from roots of established orchard trees, there is no evidence that mature trees are severely impacted. Root infection caused by *Dactylonectria* spp. is often undetected as trees may appear symptomless under nursery conditions, although tree decline and death may occur after planting. *Dactylonectria* spp. produce cylindrical, straight to slightly curved 1–4 septate macroconidia (Fig. 1) and ellipsoid to ovoid, straight 0–1 septate microconidia. The disease cycle of *Dactylonectria* spp. in avocado is not known.

Impact:

Black root rot caused by nectriaceous fungi has led to significant commercial loss of new plantings in avocado orchards around Australia over the last 10 years.

Host range and distribution:

Dactylonectria spp. cause root rot diseases in various hosts including avocado (*Persea americana*), grapevine (*Vitis vinifera*), cherimoya (*Annona cherimola*), kiwifruit (*Actinidia deliciosa*) and olive (*Olea europaea*). *Dactylonectria* spp. associated with avocado have been reported in Australia and Italy. However the fungal genus is reported globally across numerous horticultural industries.

Management options:

Hygiene is important for reducing the risk of spread. Recommended management options include removal of diseased or symptomatic plants, use of clean planting material, pasteurisation of soil, care not to over irrigate or over fertilize, adequate space between plants in the nursery and keeping plants off the ground, sourcing plants from accredited nurseries, and taking extreme care, monitoring tree health during planting and post planting establishment. Fungicides and other treatment options are being investigated.

Further Reading:

Parkinson LE, Shivas RG, Dann EK. 2017. Pathogenicity of nectriaceous fungi on avocado in Australia. *Phytopathology*, 107, 1479-1485.

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