# White root rot of avocado caused by *Dematophora necatrix*

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## Background

*Dematophora necatrix* Berl. ex Prill. (previously *Rosellinia necatrix)* is the causal agent of white root rot on a wide range of plant species. Spain, Israel and Japan have experienced severe *D. necatrix* infestation of avocado, grapevine, pear and apple orchards [1-4].
*D. necatrix* was first identified in South Africa in 1974 on apple and pear trees, and grapevines, in the Western Cape [5]. However, the pathogen was not eradicated and WRR was identified in South African avocado orchards in 2016 [6]. *D. necatrix* is now present on avocado in the Limpopo, Mpumalanga and KZN provinces.

## Symptoms

White root rot is difficult to diagnose since foliar and root symptoms are unspecific, therefore, the disease is often mistaken for Phytophthora root rot. Primary symptoms include decline of vigour, retarded growth, and sparse foliage (Fig. A). Secondary symptoms include wilting of the leaves, chlorosis, leaf drop and death of branches [2]. Death can occur within a few weeks after the appearance of the foliar symptoms. However, some hosts do not show any foliar symptoms until the plant suddenly dies, sometimes with fruit and leaves still attached to the tree. Another distinguishing symptom is the presence of white mycelial growth on the root surface (Fig. B), in the soil (Fig. C) and underneath/on top of the bark at the crown of the tree (Fig. D). *D. necatrix* will spread to adjacent trees, with trees in close proximity to each other dying consecutively [2, 4].

## Biology

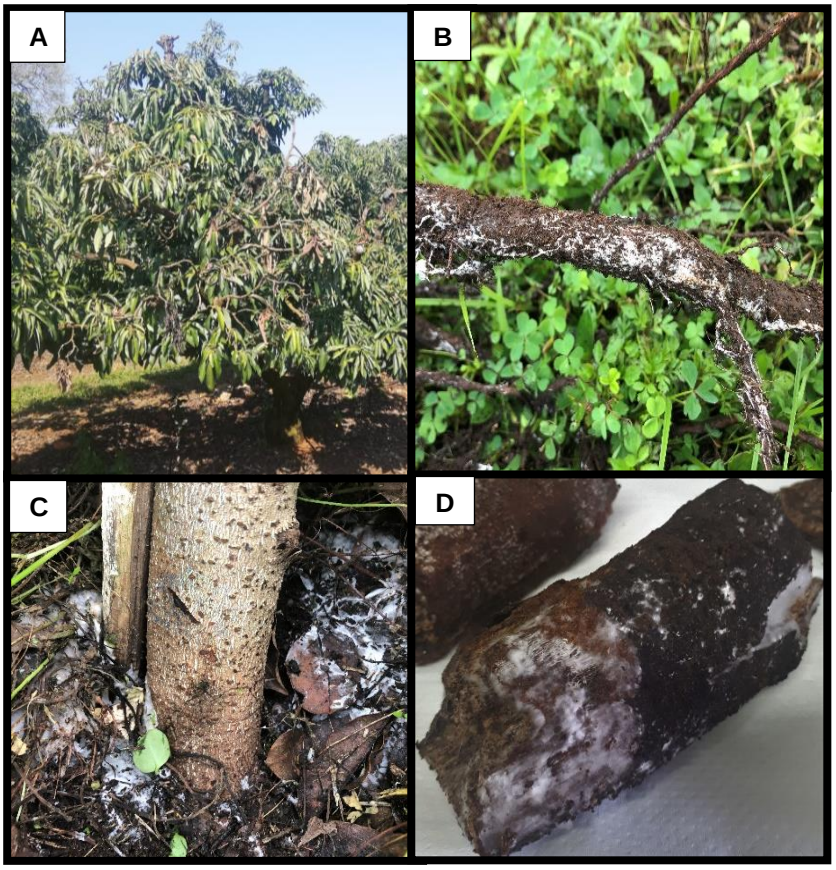
*D. necatrix* is an ascomycete fungus that can live as a saprophyte in the soil, allowing occupation of infected areas for extended periods. Mycelial growth can occur at temperatures ranging from 5-30ºC, and at pH values between 6-8 in soil and even 4-9 *in vitro* [7].

## Known Hosts

This pathogen is widely distributed over five continents and has been reported on 347 different host species to date. Economically important hosts include apple, peach, orange, pear, grape, coffee, olive and avocado [8].

## Control

Control options are limited due to the hardy resting structures of the pathogen and deep soil penetration. Numerous common fungicides have been ineffective in eradicating *D. necatrix*. However, Fluazinam (BRAVE (fluazinam 500 g/l SC)) has shown potential in controlling white root rot from *in vitro* and *in planta* trials. An integrated approach of orchard sanitation, soil solarization, biocontrol (*Trichoderma* spp.) and chemical control has shown promising results in other countries [3, 9, 10]. Orchard sanitation includes immediate removal and burning of infected trees and restricting movement in the orchard. Solarization and good soil preparation prior to planting can also improve control. Avocado rootstocks in South Africa appear to be susceptible to white root rot.




Pictures provided by South African avocado growers and Jesse Hartley.

## What to do?

1. Monitor your trees for sudden, rapid decline and death and/or the presence of white mycelia on the trunk or in the soil.
2. Fill out a FABI diagnostic clinic form, available at app.informationhub.io/form/cl3cy217x00674ts66dcfz1nl or send an email to diagnostic.clinic@fabi.up.ac.za.
3. Collect samples from the trunk (bark) and roots, package separately in brown paper bags with a wet paper towel in each, place in a crate/polystyrene box and send to the FABI diagnostic clinic.

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## References

1. López-Herrera *et al*. 1998. Plant Disease 82: 1088-1092.
2. Pliego *et al*. 2012. Molecular Plant Pathology 13: 226-239.
3. Sztejnberg *et al*. 1987. Plant Disease 71: 365.
4. ten Hoopen & Krauss. 2006. Crop Protection 25: 89-107.
5. Van der Merwe & Matthee. 1974. Phytophylactica 6: 119-120.
6. van den Berg *et al*. 2018. Plant Disease 102: 1850.
7. Anselmi & Giorcelli. 1990. Forest Pathology 20: 175-183.
8. Farr *et al*. 2020. http://nt.ars-grin.gov/fungaldatabases/.
9. Arjona-López & López-Herrera. 2020. BioControl 65: 1-9.
10. Arjona-López *et al*. 2019. Biological Control 136: 103996.