

Behaviour of *Phytophthora cinnamomi* in soils suppressive and conducive to root rot

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Abstract

Suppression of root rot in avocados caused by *Phytophthora cinnamomi* was demonstrated in soil from a grove at Tamborine Mt., Queensland. The addition of *P. cinnamomi* inoculum in amounts sufficient to cause severe root rot of plants in other soils, untreated or steam-air treated at 60°C for 30 min, produced little or no damage in the suppressive soil. Suppressive soil was found to have higher populations of bacteria and actinomycetes than soils conducive to root rot. Few sporangia were formed by *P. cinnamomi* and *P. citrophthora* in suppressive soil or soil leachate. The suppression of sporangium formation was found to be microbial and not related to the nutrient level of the soil leachate. Mycelium of *P. cinnamomi* grew through untreated conducive soils, but developed poorly in untreated suppressive soils. The fungus grew readily through all soils steam-air treated at 49, 60 and 100°C for 30 min. After 6 weeks the isolation frequency of *P. cinnamomi* had declined in the suppressive soil treated at 49 or 60°C for 30 min. Exchangeable calcium and magnesium, nitrogen, and organic matter were higher in soils suppressive to root rot than in conducive soils. Rain-forest soil, where the pathogen is not damaging, was comparable in this respect to the suppressive soil.

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