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LONG-TERM EFFECT OF SOIL SOLARIZATION THE MANAGEMENT OF AVOCADO ROOT ROT

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Root rot caused by *Phytophthora cinnamomi* Rands is the most important disease of the avocado world-wide and its eradication is difficult once established in soil. Soil solarization is a hydrothermal process that employs solar radiation to heat soil under transparent plastic film to temperatures that are detrimental to soilborne pathogens. Soil solarization was evaluated at the I.C.I.A. (Tenerife, Canary Islands), to preplant and postplant root rot management. Maximum soil temperatures under mulch were over 46 and 37°C at 5 and 15 cm depth, respectively.

The effect of temperature on the survival of 22 *P. cinnamomi* isolates obtained from different geographic origins and hosts (mainly from avocado), was tested in the laboratory. Mycelium contained on agar disks was killed after 1-2 hours treatment at 38°C. In contrast, 1-2 hours at 40°C were needed to kill all propagules when chlamydospores were present.

Preplant soil solarization was evaluated in a plot from which 15-year-old diseased avocado trees had been removed. After solarization, 1-year-old seedlings of avocado were planted. Soil solarization significantly reduced disease incidence and severity. After two years, up to 39% of control avocados died while 97% survived in solarized soil, 95% of them without disease symptoms. After 5 and 10 years, percentage of dead plants in solarized soil was 19 and 27%, respectively, whereas it was 91 and 100% in non-solarized soil.

Repeated soil solarization for 4 consecutive summers of 14-year-old avocado in an established orchard revealed that adult tree solarization was less effective although disease index increases were lower in solarized avocados.

Our research indicates that soil solarization as preplant treatment reduced avocado root rot incidence, providing good control at least two years after solarization. However, it did not eradicate avocado root rot. Solarization may become a viable component in integrated management strategies, combining with fumigation and cultural and biological control.