

Correction of zinc and boron deficiencies and control of phytophthora root rot of avocado by trunk injection

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Abstract

Phosphonate at 3 concentrations (7.5, 10 and 20%) was injected into the trunks of avocado (*Persea americana* Mill.) trees showing advanced symptoms of canopy decline caused by phytophthora root rot. All formulations of phosphonate and potassium phosphonate, including the lower rates of 7.5 and 10%, successfully controlled root rot and resulted in improved tree health. The 7.5% phosphonate treatment permitted the formulation of chemically compatible mixtures containing zinc and boron which, when trunk-injected, increased the concentrations of these nutrients in mature summer-grown leaves. Phosphonate formulations containing 17% zinc chelate or 10% zinc nitrate and injected twice during a growing season, at 15 mL/m canopy diameter, increased leaf zinc concentrations above the critical level of 30 mg/kg DM. However, the inclusion of zinc chelate in formulations substantially increased the time of uptake of the injection compared with the formulation containing zinc nitrate. Phosphonate formulations with 0.9% boron, injected twice during a growing season at 15 mL/m canopy diameter, improved leaf boron concentrations, but they failed to reach the critical threshold concentration of 50 mg/kg DM.

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