

Seed Dressing and Foliar Spray of Green Bean (*Phaseolus vulgaris* L.) with Essential Oils and Disinfectants for Suppressing Root Rot and Wilt Incidence under Field Conditions

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Abstract : The efficacy of two essential oils applied as a bean seed dressing followed by seedlings foliar spray with four commercial disinfectants against root rot and wilt incidence was evaluated under field conditions. The essential oils, grape seed and peppermint oils and the disinfectants, Gold, Revarest, Klenva, Malva were applied. Chitosan and the fungicide Topsin-M were used as comparison treatment. Essential oils individually or combined with disinfectants were applied as a bean seed dressing. Furthermore, emerged bean plants were sprayed with the same treatments. Under laboratory conditions, growth inhibition effect was observed for the isolated, tested fungi *R. solani* and *F. oxysporum* when exposed to essential oils individually or combined with disinfectants. A high inhibitor effect was recorded for peppermint followed by grape seed oils. Concentrations of 1% and 2% of chitosan as well as Topsin M at 400 ppm showed complete reduction (100%) in the two fungal growths. Under field conditions, the obtained results showed that the applied treatments of chitosan had a superior effect on root rot and wilt disease incidence compared with other tested treatments. It was found that seed coating treatment provides good protection of emerged green bean seeds against the root pathogens attack compared with the fungicide and control treatments. Also, the application of seed dressing with essential oils accompanied by seedling spray demonstrated similar results. It was observed that essential oils had an enhancing effect against disease incidence when combined with disinfectants compared with their application. The obvious yield increase was significantly higher in all applied treatments than in fungicide and control.

Keywords : bean, disinfectants, essential oils, root rot, wilt

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