

Title Comparison of the Inhibitory Effect of Captan, Chitosan-Lignosulphonate Polymer and Eugenol Coated Seeds Against Rice Seed Borne Fungi

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Abstract

Presently, chemical seed treatments are in discussion due to their possible directly or indirectly impacts on human health or other living organisms. They may also negatively affect the ecosystem and the food chain. In rice seeds, chemicals may cause phytotoxic effects including grain degradation. Eugenol is the main component of clove (*Eugenia caryophyllis*) oil and it is known as an active agent against many pathogenic seed borne fungi. It acts simultaneously as bactericide, fungicide and viroicide. Moreover, it is non-toxic for humans if it is applied in normal doses. The present study compared the inhibitory effect of the following applications for rice seed treatment to protect them against seed borne fungi during 12 months of storage: eugenol incorporated into chitosan-lignosulphonate polymer, only chitosan-lignosulphonate polymer and captan. The Blotter method was used for the determination of seed infection. The obtained results of fungi inhibition showed at first that captan treatment led to a better, i.e. longer, inhibitory effect on *Alternaria padwickii*, *Rhizoctonia solani*, *Curvularia* sp., *Aspergillus flavus*, and *Aspergillus niger* than eugenol incorporated into chitosan-lignosulphonate polymer. Secondly, eugenol incorporated into chitosan-lignosulphonate polymer showed the longest inhibitory effect against *Bipolaris oryzae* and *Nigrospora oryzae* compared to captan and only chitosan-lignosulphonate polymer treatments. Finally, both captan and eugenol incorporated into chitosan-lignosulphonate polymer showed non-significant different inhibitory effect on *Fusarium moniliforme*. The variant of only chitosan-lignosulphonate polymer for seed coating was only during the first 6 months of storage able to inhibit all species of the observed seed borne fungi, whereas captan and eugenol incorporated into chitosan-lignosulphonate polymer were capable to inhibit most of the fungi until 9 months of storage.