

Bio Efficacy of Different Non-Hazardous Alternative Chemicals and Commercial Fungicides for Controlling Groundnut Stem Rot by *Sclerotium rolfsii*. S

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Abstract

In Sri Lanka groundnut (*Arachis hypogaea* L) is grown mainly for edible purposes and it's mostly affected by stem rot disease that is caused by the necrotrophic soil-borne plant pathogen *Sclerotium rolfsii*. To control stem rot disease, farmers generally use commercial fungicides that lead to developing resistance forms of *S. rolfsii*. The present study was conducted to identify environmentally sound nonhazardous alternative chemical products to control *S. rolfsii*. Two non-hazardous alternative chemicals (Na₂CO₃ (T6) and NaHCO₃ (T7)) are investigated with five commercially available fungicides (Captan (T2), Carbendazim (T3), Mancozeb (T4), Chlorothalonil (T5), and Sulfur (T8)) with different concentrations under *In-vivo* and *In-vitro* conditions. The field experiment was laid out in a Randomized Complete Block Design on eight treatments with three replicates for two different concentrations (500ppm and 1000 ppm). The *In-vitro* experiment was laid out in Complete Randomized Design on eight treatments with five replicates for two different concentrations (500ppm and 1000 ppm). In the *In-vitro* conditions, the mycelial growth inhibition rate was measured. From the mycelial growth inhibition, T6 (Na₂CO₃) and T7 (NaHCO₃) successfully inhibited mycelial growth like commercially available fungicides at 1000 ppm (T6-100% and T7-100%). In 500ppm concentration, the complete inhibition rate (no mycelial growth) was observed in T6 (Na₂CO₃). In *In-vivo*, the disease incidence was recorded. From that results, there is no significant difference between commercial fungicides and non-hazardous alternative chemicals (Na₂CO₃ and NaHCO₃) in both concentrations (500 ppm and 1000 ppm). Therefore the non-hazardous alternative chemicals (sodium carbonate and sodium bicarbonate) were equal and superior to the other fungicides for control of *S.rolfsii* on groundnut in 500ppm and 1000ppm concentrations.

Keywords: Groundnut stem rot, *Sclerotium rolfsii*.S, Sodium carbonate and bicarbonate

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