Evaluating the Efficacy of Plant Extracts in the Management of Early Blight of Tomato

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Abstract

Tomato (*Lycopersicon esculentum*) is one of the most important vegetable crops grown in Kenya. Tomato production in Kenya faces a number of constraints including pests and diseases. One of the major fungal diseases of tomato is early blight caused by *Alternaria solani*. The study set out to evaluate the efficacy of garlic and ginger extracts as an alternative management option for early blight. Garlic has the allicin (diallyl thiosulfate) as the active ingredient with antifungal properties while ginger has zingeroles, gingerols and shagaols as the major compounds. The study was carried out at the University of Embu and laid out in a randomized complete block design replicated three times using the susceptible tomato cultivar, Rio Grande. Treatments included; garlic applied at the concentration of 1g in 5 ml of water, ginger at the concentration of 1 g in 10 ml water, Ridomil Gold (metalaxyl-M 40g/1kg +Mancozeb 640g/1kg - a standard commercial fungicide) and plain water as the control experiment. The treatments were applied at an interval of seven days immediately after the disease symptoms appeared. Data was taken on disease severity using a severity scale with five-point score. Data was subjected to Analysis of Variance using SAS software and means separated using least significant difference (LSD). Severity scores were significantly different between treatments. Water had the highest disease severity (2.9) as compared to Ridomil Gold (1.4) and garlic extract (1.9). However, there was no significant difference in the severity scores in the treatments between water and ginger. The antifungal effects of garlic could be due to the presence of allicin which react with thiol groups of various enzymes thus affecting the metabolism of cysteine proteinase activity involved in the virulence of *A. solani.* In reducing the harmful effects of inorganic chemicals garlic extract could be used as an alternative control for the management of early blight in tomato.