

Evaluating the Effect of Soil Amendments to Reduce *Ralstonia solanacearum* Population Density in a Potato-Cultivated Soil in the Up Country Intermediate Zone (IU3) of Sri Lanka

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Reducing the initial inoculum density of the pathogen, *Ralstonia solanacearum* in soil is an effective strategy to control the bacterial wilt of potato. The present study evaluated the potential of locally available soil amendments for reducing the density of *R. solanacearum* in potato-grown soils reported to have wilt infection. Four soil amendments were used namely half-burn paddy husk, rice husk biochar, and radish and mustard plant residues at a rate of 2 kg/m² on fresh weight basis. Fresh wild sunflower (*Tithonia diversifolia*) leaves (2 kg/m²) with Urea (20 g/m²) and CaO (200 g/m²) was used as an already identified soil amendment effective for wilt pathogen. A treatment with no soil amendment served as the control. Potato var. Granola was planted two weeks after the incorporation of the soil amendments. The field experiment was arranged as a randomized block design with three replicates. Soil samples were collected five times (i.e. before the addition of soil amendments, at the time of planting, and one, two, and three months after planting (i.e. harvesting)) and plated on TZC medium by dilution plate technique. The virulent pathogen density in soil was calculated based on the colony morphology of *R. solanacearum* on the TZC medium. The density of the virulent *R. solanacearum* in soil varied significantly ($p < 0.05$) due to the interaction effect of sampling times and treatments. Half-burn paddy husk, *Tithonia*+Urea+CaO (TUC) and radish residues reduced the virulent pathogen density significantly from the time of planting until the harvesting stage. At harvesting, the lowest pathogen density was reported by the TUC amendment. Mustard residues reduced the pathogen density from one month after planting. Rice husk biochar significantly reduced the pathogen density, except for two months after planting. The study confirmed the tested soil amendments' effectiveness in reducing bacterial wilt.

Keywords: Bacterial wilt, Brassicaceae crop residues, Wild sunflower