ABSTRACT

Effect of Legume Extracts on Germination, Seedling Health of Beans *(Phaseolus vulgaris L.*) and Soil Microorganisms

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Application of undecomposed green manure has been reported to cause poor emergence and establishment of common beans in the field. Therefore, to understand the mechanisms' contributing to the poor crop establishment, the effect of extracts from fresh and decomposed legume green manures on bean seed germination, fungal mycelial growth, spore germination and germ tube elongation were evaluated. The extracts were prepared in either ethanol or distilled water. Data was collected on percentage seed germination, seedling length, mycelial radial growth, spore germination and germ tube elongation. Ethanol extracts from fresh lablab inhibited bean germination by 56%, increased mean germination time to 8 days, and decreased germination index while ethanol extracts of groundnut and beans caused highest inhibition in bean shoot length and reduced biomass. Ethanol extracts from fresh green manures significantly inhibited fungal mycelia growth while the aqueous extracts from beans, groundnuts and soybean had significant level of antifungal activity while aqueous lablab extracts stimulated mycelial. Aqueous extract of lablab and soybean enhanced spore germination by over 70% with more pronounced effect on germ tube length and number of germ tubes by 8.0% and 13% respectively. The study comparatively reveals that the extract of lablab was inhibitory to common bean germination compared to other legume extracts and also stimulated the growth of root rot pathogens that may have resulted in poor establishment of beans.

Keywords: legume extracts; microbial decomposition; *Phaseolus vulgaris*; root rot pathogens