

IDENTIFICATION OF EFFECTIVE *Rhizobium* STRAINS TO PRODUCE SUITABLE INOCULANTS TO IMPROVE GROWTH AND YIELD OF *Arachis hypogaea* (GROUNDNUT)

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Groundnut (*Arachis hypogaea* L.) is a food legume which is widely grown in the tropical countries that fix atmospheric nitrogen through symbiotic relationship with *Rhizobia*. In order to get a sufficient yield from groundnut cultivation, it is necessary to apply nitrogen fertilizer (urea). Modern intensive agricultural systems uses substantial amounts of chemical fertilizers more than the recommended level by Department of Agriculture to sustain high productivity. These chemical fertilizers causes adverse effect to the natural environment and human health as well as the microorganisms in the soil. Through *Rhizobial* inoculation, the requirement for application of nitrogen fertilizer (urea) can be replaced. Use of such inoculants could reduce the cost of production of food crops while minimizing the environmental pollution. In this study performance of inoculated ground nut and fertilized groundnut plants with a control was studied. A field soil based pot experiments were carried out to determine the superior strain with higher effectivity and infectivity. The pot experiment was laid out in Complete Randomized Design in the greenhouse of National Institute of Fundamental Studies, Kandy. Five treatments were applied as control, standard and previously screened three strains with three replicates. Farmers' practices or with nitrogen fertilizer was considered as the standard and control was set without inoculation and nitrogen fertilizer. Tap root and lateral root nodule count, nodule dry weight, chlorophyll content, root dry weight and shoot dry weights were measured at the flowering stages of the plants. The results revealed that unexpected higher number of nodulation, shoot dry weight and shoot length were observed in control. Further, inoculated treatments were also indicated higher number of nodulation, shoot dry weight and shoot length than treatments with recommended N fertilizer. Presence of native superior strain attached in the seeds results the higher number of nodules and shoot dry weights in the control treatment. Current study revealed that the use of *Rhizobial* inoculation of groundnut appears to be effective comparing with the recommended N fertilizer. However, further studies are needed to confirm the effects of *Rhizobial* inoculants for groundnut with the strain isolated from the control to evaluate their performances with the other strains in different field conditions.

Keywords: *Groundnut, Inoculant, Nitrogen fertilizer, Nodulation, Superior strain*