Development of a new biofertilizer system using Gliricidia plants grown in Sri Lank

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Use of biomass fertilizers appears to be the most appropriate way of adding nutrients into the soil which is environmental friendly and suitable for local conditions. Among the biomass fertilizer sources, Gliricidia has been identified as the most suitable nitrogen fixing legume. Some experiments that have been carried out showed that the Gliricidia with high N content and low lignin level is more suitable as N source. An investigation carried out to determine the nitrogen (N), phosphorous (P), and potassium (K) contents of different parts of gliricidia plant and to develop a slow-release nitrogen biomass fertilizer systems using gliricidia plant. Four types of gliricidia plants (Provenance Trail Series of *Gliricidiasepium* 17/84 Oxford Forestry Institute (OFI), *Gliricidiasepium* 25/84 OFI, *Gliricidiasepium* 25/84 OFI and *Gliricidiasepium* (Local species)) were obtained from Rathmalagara estate, Madampe in Coconut Research Institute (CRI) in Sri Lanka.

According to the experimental results the level of nitrogen in different parts of the gliricidia plants varied from 27860 mg $kg^{-1}$to 5222 mg kg^{-1}. It was found that phosphorous and potassium content in gliricidia plant varied from 892.2 mg kg^{-1} to 1258.2 mg kg^{-1} and from 208.6 mg kg^{-1} to 8678.5 mg kg^{-1} respectively. Biofertilizers were prepared from gliricidia bark chips after treated with a saturated solution of urea (CH_4N_2O). The morphology and physiochemical parameters of treated gliricidia bark chips were investigated. Experimental result indicated that after gliricidia bark chips were treated with urea, total nitrogen content in the bark increased by more than 200% giving the value as 36700 mg kg^{-1}.The initial nitrogen content in the bark was 17878 mg kg^{-1}. This study also evaluated the release pattern of nitrogen from impregnated gliricidia wood chips in a soil matrix and found that nitrogen was released in a slow-release pattern. The above findings confirm and gave promising results to further develop urea incorporated gliricidia bark particles as a slow-release new biomass fertilizer system.

Key words: biofertilizers, slow-release fertilizers, gliricidia, urea, nitrogen

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