

EVALUATING BETEL WASTE AND EXPLORING ITS POTENTIAL AS AN ECO-FRIENDLY ALTERNATIVE FERTILIZER

G.C.R. Gamage¹, D.M.P.V. Dissanayaka², A.N. Kodithuwakku and G.A.S. Ginigaddara¹

¹*Department of Agricultural Systems, Faculty of Agriculture, Rajarata University of Sri Lanka, Anuradhapura, Sri Lanka*

²*Intercropping and Betel Research Station, Department of Export Agriculture, Dampelessa, Narammala, Sri Lanka*

Betel (*Piper betle*) is an export crop that serves as a source of livelihood for many farmers in the Northwestern and Western provinces of the country. Despite its importance, there is a scarcity of research focusing on issues related to betel cultivation, particularly regarding post-harvest losses and their related uses. Hence, this study was conducted to investigate betel losses among different farming scales and the potential of developing a plant growth booster by utilizing betel waste. The study was conducted in two phases; a questionnaire survey and laboratory analysis to evaluate the quality of the composts developed from betel waste. A questionnaire survey was conducted in Kurunegala district to collect primary data comprising 80 farmers representing large-scale, small-scale farmers sellers (domestic and exporters). Several compost samples were prepared through different compositions as T1: cow dung, *Gliricidia sepium*, dried crop residues (20: 07: 03), T2: cow dung, betel, dried crop residues (20:07:03), T3: poultry manure, betel, dried crop residues (20:07:03), T4: cow dung, betel, dried crop residues (13:13:04) and T5: poultry manure, betel, dried crop residues (13:13:04) with three replicates. The nutrient composition: total available nitrogen (N) phosphorus, and potassium (K) were tested by following standard analytical protocols and compared with government standards. Findings revealed that the mean weekly betel losses varied among different groups: farmers, sellers (both large and small scale), and exporters, with values of 6.8 kg, 22.2 kg, 5.4 kg, 18. and 28.4 kg, respectively. Notably, T3 exhibited significantly higher nitrogen (1.738%, $p=0.0001$) and potassium content (0.087, $p=0.001$) than other tested treatments. The study suggests that T3 shows potential for use as an eco-friendly plant growth enhancer suitable for all stages of crop growth, but this requires confirmation through field trials. Additionally, given the oversight on betel waste, efforts should be taken to assess betel waste and promote efficient waste utilization methods to develop eco-friendly plant growth boosters as an alternative to synthetic fertilizers.

Keywords: Betel, Plant Growth Promoter, Waste Utilization, Sustainable Agriculture