



Enhancement of biogas production of tea waste by co-digestion with market waste

Kumara, M.P.C.U. and Wijetunga, S.

Department of Agric Engineering, Faculty of Agriculture, University of Ruhuna, Mapalana, Kamburupitiya, Sri Lanka.

✉ swije@ageng.ruh.ac.lk

Tea is one of major plantation crop in Sri Lanka and spread in both low country and up country. During the process of black tea production, 3-5% of waste tea is generated. No effective methods are adopted to manage waste tea in Sri Lanka. Therefore, this research was forecasted to evaluate the potential of tea waste for the produce biogas as an alternative approach to get the benefit from tea waste. The objective of the study was to optimize the biogas production from tea waste by mixing with market waste. Research was conducted in the laboratory in 5 L plastic cans as batch reactors. Five treatments with three replicated were adopted in different ratio of tea waste with market garbage. Physical and chemical properties of tea waste and market waste were analyzed before commencing the experiment. Bio gas production was measured daily and slurry was taken at once a week to determine the pH. Physical properties of the slurry were also determined at the end of the gas production to determine the degradability. According to the results, higher bio gas production was noted in treatment 4 and 5 where the 25% and 12.5% of tea waste used with market waste. Bio gas production is inversely proportional to the amount of tea waste into the digesters. The maximum bio gas production (16680 ml per 1kg of dry mater) was observed in the treatment 5 (12.5%tea waste+87.5%market waste). The lowest biogas production (8725 ml per 1kg of dry mater) was determined in reactor with 25% of tea waste. Based on the study conducted, it can be concluded that tea waste can be used for the production of biogas by mixing with market waste with or without market.

Keywords: biogas, anaerobic digestion, tea waste, marker waste