

## Potential of Crude Palm Oil for Biodiesel Production in Sri Lanka

G.R.M.S Galkaduwa and C.P. Rupasinghe\*

Department of Agricultural Engineering, Faculty of Agriculture, University of Ruhuna

### Abstract

Declining global fossil fuel storage due to increasing consumption and associated environmental pollution have created an urge for investigating the production of renewable and environmentally friendly biofuel. Biodiesel can be considered as one of the most perspective alternative fuels since it is a non-toxic and can be produced from different renewable sources through simple cost-effective methods. The choice of a catalyst for the biodiesel transesterification method primarily depends on the quantity of free fatty acid contents of raw materials. This study was aimed to test the potential of biodiesel production from crude palm oil by using base catalyst. Crude palm oil from Palm Oil factory of Watawala Plantation Ltd, Galle, Sri Lanka was tested for free fatty acid (FFA) content. Crude palm oil was pre-treated with NaOH as catalyst and 20% of anhydrous methanol amount according to oil volume was added for transesterification. It was found that FFA value of the oil was 7 mg NaOH/g which is in favorable limits for alkaline transesterification. The biodiesel yield was estimated as 80% of plant oil through base catalyst transesterification. The produced palm oil methyl ester was characterized. The properties were tested as gross calorific value 40.5 MJ/kg (ASTM D 240), density at 15°C of 878 kg/m<sup>3</sup>(ASTM D 1298), ash content 0.02% (ASTM D6751) and acid value 0.34mg NaOH/g (D 664). The production cost of biodiesel by base catalyst transesterification was estimated as 791 rupees per liter. All the tested parameters were within the accepted limits of the biodiesel standards thus making it an alternate fuel for compression ignition engines.

**Keywords:** Biodiesel, Calorific value, Palm oil methyl ester, Transesterification

**\*Corresponding Author:** chintha@ageng.ruh.ac.lk