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STUDY ON THE APPLICATION OF BIODIESEL TO OPERATE THE FARM MACHINERY

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ABSTRACT

The study aims to utilize waste cooking oil as a raw material to produce biodiesel and evaluate the biodiesel suitability to operate farm machinery. The variables of the study were three different mixing ratios for biodiesel, namely 5% biodiesel with 95% diesel, 20% biodiesel with 80% diesel, 0% biodiesel with 100% diesel (as a control treatment), two gearbox positions, i.e. the first and second gear during the trial phases, two fuel lever positions, i.e. half lever position and full lever position and two operation modes, i.e. without load operation and with pulled load. The measurements of this study were the output engine power, specific fuel consumption, the emission percentage of exhaust gases, measurement of noise for operator and bystanders. The obtained results revealed that B20 recorded less values compared with diesel fuel. Increasing biodiesel in fuel mixture led to less output engine power compared with diesel fuel. Increasing biodiesel in fuel mixture led to higher rate of specific fuel consumption than diesel fuel. B20 recorded the least values of carbon monoxide and carbon dioxide compared with diesel fuel. Whereas, B20 recorded highest values of No_x. Increasing biodiesel in fuel mixture caused less noise for both operator and bystanders compared with diesel fuel.