Abstract- The methyl esters of vegetable oils known as biodiesel are becoming increasingly popular because of the low environmental impact and potential as a green alternative fuel for diesel engine and they would not require significant modification of existing engine hardware. Methyl esters of Jatropha (JME), Pongamia (PME) and Mahua (MME) are derived through transesterification process. Experimental investigations have been carried out for methyl esters of different oil in blends with diesel of different proportions. It was observed that a diesel engine runs successfully on a blend 20% biodiesel and 80% diesel fuel without affecting engine performance. Methyl esters from Jatropha, with properties close to diesel, show better performance, combustion and emission characteristics, followed by esters of Pongamia and Mahua. Hence Jatropha blend can be used in existing diesel engines without compromising the engine performance.