List of Figures

Figure 1: State Wise Area of Mustard Seed Production in India.................................................2
Figure 2: Area, Production & Yield of Mustard Seed in India..................................................3
Figure 3: World Area, Production & Yield of Mustard Seed......................................................4
Figure 4: Production of Mustard Seed in Top 5 Countries.......................................................5
Figure 5: Major Mustard Producing Countries.........................................................................6
Figure 6: Main Biomass Conversion Processes.........................................................................11
Figure 7: Sources of Biofuel.......................................................................................................15
Figure 8: Process Chart How Cereal Grain convert into Bioethanol..........................................16
Figure 9: Transesterification of Triglycerides with Alcohol.....................................................36
Figure 10: Temperature vs. Kinematic Viscosity Curve for Diesel, Biodiesel and their Blends..........................................................................................................................51
Figure 11: Temperature vs. Density Curve for Diesel, Biodiesel and their Blends.....................53
Figure 12: Experimental Setup...................................................................................................56
Figure 13: Change in Bsfc with Bhp for Various Fuels and Blends............................................57
Figure 14: Change in Brake Thermal Efficiency with Bhp for Diesel and Bio Diesel Blend Fuels.................................................................................................................................58
Figure 15: Change in Exhaust Gas Temperature with Bhp for Various Fuel and Blends...........59
Figure 16: Comparison of CO₂ Emission in PPM during Fossil Diesel and B10 Uses..............60
Figure 17: Comparison of CO Emission in PPM during Fossil Diesel and B10 Uses...............60
Figure 18: Comparison of NOx Emission in PPM during Fossil Diesel and B10 Uses.............61
Figure 19: Comparison of SO₂ Emission in PPM during Fossil Diesel and B10 Uses.............61
Figure 20: Comparison of Exhaust Gases Temperature in ⁰C During Fossil Diesel and B10 Uses.............................................................................................................................62
Figure 21: Price Increasing Rate of Fossil Diesel with Biodiesel (An assumption).....................69