A Comparison of GHG Emissions of Biodiesel from Hazelnut Oil and Soybean Oil

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ABSTRACT

The most commonly used feedstocks to produce biodiesel in the U.S. are soybean oil and yellow grease. Other feedstocks include rapeseed, common in Europe, palm and coconut oil, found in Southeast Asia, and jatropha, native to Central America but now grown in a variety of tropical and subtropical regions. The use of first generation biofuels, such as corn ethanol and soybean biodiesel, have raised numerous environmental concerns, particularly regarding greenhouse gas (GHG) emissions. An additional concern is whether fuels derived from these crops create a food-to-fuel pathway which may divert production of food crops to energy crops. Land use problems are also associated with traditional bioenergy crops. These include clearing additional land for agriculture, thereby increasing the net carbon-footprint by releasing stored soil carbon and eliminating the carbon sink function of the once-intact ecosystem. Therefore, development of new types of energy crops that can avoid or minimize these issues is essential to an environmentally sustainable, fossil fuel independent future. Hazelnuts, also known as filberts (Corylus sp.), are such a potential energy crop. In this study, the GHG based LCA of biodiesel manufactured from US grown hazelnut oil is compared with biodiesel manufactured from soybean oil and also fossil diesel fuel.

Key words: LCA, Biodiesel, Advanced Biofuels, Sustainable biofuels, Food-to-Fuel Pathway.