

EXECUTIVE SUMMARY: *(State in layman's terms the application's broad, long-term objectives and specific aims, making reference to the potential public benefits of the project for California.)*

Biodiesel fuels have been prepared from a wide variety of feedstock oils, most commonly soybean and rapeseed (canola) oils. Many of these oils have become increasingly embroiled in the “food versus fuel” debate, leading researchers to consider alternative biodiesel feedstocks from specialty crops such as tree nut oils. California produces many specialty crop tree nuts, including more than 80 % of the world's almonds. In 2007, there was a surplus of 274 million pounds of saleable almonds. The oil from these almonds could be converted into a high-quality biofuel, providing a local and renewable energy resource for our energy-pinched state. This almond oil derived biodiesel fuel would keep money local, providing a renewable fuel for transportation and farm equipment alike. Undergraduate students involved in this project will optimize the preparation of biodiesel fuel and characterize the prepared biofuels extensively. One component of the characterization which is particularly important in evaluating the almond oil derived biodiesel fuel is the measurement of the distillation, or boiling, curve. The distillation curve is an important measurement, which can be used to predict many fuel properties as well as to measure the composition and combustion energy as a function of the boiling curve. The overall objective of this work is to assess the feasibility of using almond oil as a feedstock for locally grown, sustainable biofuels which do not deter major food crops from the consumer.