

Fact Sheet-- Renewable Energy

Bio-Diesel

Description

Emerging as an economical way to offset rising fuel prices, Bio-Diesel has become a popular renewable resource for farm and vehicle use. It provides a way to diversify a farm's product mix and revenue system.

In the United States, soybeans are a well-established feedstock for bio-diesel production. Other areas are developing crops such as canola, sunflowers, crambe, and camelina. Field production output can be approximately 50-200 gallons per acre, depending upon the crop and the local growing conditions. Biodiesel can also be produced from yellow grease and used cooking oil.

Fuel Mix

Mixing standards vary depending on locale. Examples of blends include B-20 (20% bio-diesel/80% diesel) and B-2 (2% bio-diesel/98% diesel). Many states have set standards to qualify for incentives and tax credits. Some States mandate that all diesel sold in that State contain a minimum quantity of biodiesel.

Bio-Diesel has an energy output of about 91% compared to regular diesel. For this reason, a bio-diesel fuel mix maintains a lower output per gallon than diesel.

Energy Output

Fuel Mix	BTUs/gallon	% BTUs compared to Diesel
#2 Diesel	129,000	100%
Bio-Diesel	118,296	91.35%
B-20	127,259	98.27%
B-2	129,276	99.83%

Cold weather start-up is a consideration. B-20 will start to gel at about 10° F and B-100 will start to gel at 28° F. Consult your supplier about cold starts.

Bio-Diesel and Air Quality

A 1998 life cycle study sponsored by the Departments of Energy and Agriculture* reported that biodiesel reduces net CO₂ emissions by 78% when compared to petroleum diesel. In addition, there is a 75-85% reduction in cancer-causing polycyclic aromatic hydrocarbons.

Research to-date has been mixed on whether biodiesel generates more or less NO_x than regular diesel, but it appears unlikely that significant NO_x reductions will be achieved with current biodiesel formulations. However, biodiesel sulfur content is much lower than regular diesel. So much so that it meets EPA's new regulations.

Rotational Benefits

Soybeans and canola are alternative choices for field rotation. Soybeans provide nitrogen-fixing capabilities and canola provides a bio-fumigation effect on cereal diseases.

Global Aspects

The increase in energy costs has sparked global interest in biodiesel production. Brazil, which already leads the world in ethanol production, has recently mandated a 2% biodiesel blend in all diesel pumps and plans to increase that mandate to 5% by 2010.

Palm oil from Indonesia and Malaysia has surpassed soybean oil as the most widely-produced oil worldwide. It has become a popular choice for biodiesel production, raising concerns regarding land use and the loss of native forest vegetation. China and India both have plans to develop the oil-rich crop of *Jatropha curcas* for biodiesel. Plantations are already under development in those countries.

For More Information

For more information on biodiesel or renewable energy, contact the NRCS Energy National Technology Development Team at the West National Technology Support Center in Portland, OR, Stefanie Aschmann, Team Leader, 503-273-2408, stefanie.aschmann@por.usda.gov.



A canola field in MT.

*U.S. Department of Agriculture and U.S. Department of Energy. 1998. Life Cycle Inventory of Biodiesel and Petroleum Diesel for use in an Urban Bus. NREL/SR-580-24089 UC Category 1503. <http://www.biodiesel.org/resources/reportsdatabase/>