



E³A: Biodiesel Applications for the Home, Farm or Ranch

Steps in the Biodiesel Series

Consumer Issues

Oilseed Processing

Production

Economics

Consumer Issues

As prices for products and services rise, it's wise for customers to search out the best value for their money. Diesel fuel prices have been volatile in recent years, causing some to take a closer look at their diesel fuel consumption habits. You can reduce petroleum diesel use by driving less, purchasing a more fuel-efficient vehicle or by purchasing an alternative fuel such as biodiesel.

What is biodiesel?

Biodiesel is a fuel produced by a chemical reaction between a vegetable oil or animal fat, an alcohol and a catalyst. One of the advantages of biodiesel is that in most cases, biodiesel can be used in a standard diesel engine. You can switch between diesel and biodiesel at any time.

Is vegetable oil the same as biodiesel?

Biodiesel is not the same as vegetable oil. Although vegetable oil is the main ingredient in most biodiesel, the vegetable oil must undergo a chemical reaction (transesterification) with alcohol and a catalyst before it is considered biodiesel. Vegetable oil that has not undergone a chemical reaction is commonly referred to as waste vegetable oil (WVO), straight vegetable oil (SVO) or virgin oil.

What do B2, B5, B20 and B100 mean?

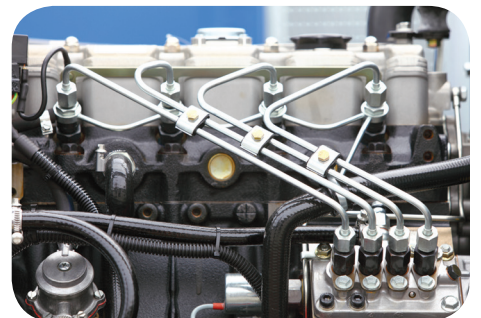
Biodiesel is usually blended with petroleum diesel before it is sold. Biodiesel is commonly sold as a 2, 5, 20 or 50 percent blend with petroleum diesel. A fuel sold as B20 will contain 20 percent biodiesel and 80 percent petroleum diesel. Biodiesel not blended with petroleum diesel is referred to as B100, neat biodiesel or pure biodiesel.

Are engine modifications required to use biodiesel?

Biodiesel can degrade some natural rubber compounds that are used in fuel lines on older diesel engines, such as those manufactured before 1993. If you intend to use blends of biodiesel rated B20 or higher on a regular basis in an older vehicle, you may need to replace the fuel lines with synthetic fuel lines. Some seals are also made of natural rubber compounds that may need to be replaced. Most newer vehicles use synthetic fuel lines and gaskets, so modifications are generally not necessary.

Will biodiesel damage my engine?

Biodiesel that meets the appropriate fuel quality standards is unlikely to damage a diesel engine. The fuel quality standards for biodiesel are defined by the American Society for Testing and Materials (ASTM) in standard ASTM D6751. This standard includes acceptable levels for water and sediment, sulfur, free and total glycerin, flashpoint, cetane number and other specifications. Petroleum diesel fuel is also required to meet fuel quality standards. These standards are defined in ASTM D975-05. Biodiesel produced for personal use is often not tested against these fuel standards. The quality of the biodiesel may vary depending on the quality control measures of the biodiesel producer.



Will using biodiesel void my engine manufacturer's warranty?

Engine manufacturers typically only offer warranty on the engine for defects in “material and workmanship.” Engine manufacturers also recommend the type of fuel the engine is designed to use. Engine damage caused by fuel (of any type) is generally not the responsibility of the engine manufacturer. Many engine manufacturers have issued statements about their recommendations for biodiesel use. Some of these statements are available at <http://www.biodiesel.org>.

How much energy does biodiesel contain?

Biodiesel contains 118,296 btu per gallon. This is approximately 8 percent less than the 129,000 btu per gallon for No. 2 petroleum diesel. You can find more information at <http://www.biodiesel.org>.

Where can I buy biodiesel?

Biodiesel is not available at most retail fuel locations. The National Biodiesel Board maintains a list of biodiesel retailers across the country.

Will biodiesel work in the winter?

Biodiesel has higher cloud and pour points than petroleum diesel, which means biodiesel is more likely to gel in the winter than diesel fuel. Cold-weather properties of biodiesel vary based on the type of oil or animal fat used to produce the biodiesel. Most biodiesel is produced from soy oil. Soy oil biodiesel (B100) has a pour point of approximately 32 degrees F, whereas No. 2 diesel fuel has a pour point of approximately minus 18 to minus 16 degrees. Biodiesel produced from other feedstocks such as canola or palm oil will perform differently in cold weather. Find more information on cold-flow properties at <http://www.biodiesel.org/what-is-biodiesel/biodiesel-fact-sheets>.

Do fuel taxes apply to biodiesel?

Biodiesel is taxed like petroleum diesel fuel. Biodiesel purchased at a retail station will have the taxes included in the price. Biodiesel producers — even small producers — must register with the state of Missouri and pay the applicable fuel taxes. Biodiesel for off-road use is eligible for a refund of a portion of the fuel taxes paid, similar to dyed diesel fuel.

Is biodiesel cheaper than diesel?

Commercially produced biodiesel tends to be more expensive than diesel fuel. The price premium relative to diesel fuel varies over time but has ranged from \$0.11 to \$1.17 per gallon in recent years based on data from the Clean Cities Alternative Fuel Price Report. The average price premium has been \$0.58 per gallon. Small-scale personal biodiesel producers that have access to free or low-cost used vegetable oil can sometimes produce biodiesel for less than the price of diesel fuel.

Is biodiesel good for the environment?

It depends on a number of factors, but for the most part the answer is yes. Depending on which environmental attributes are measured and how you measure them makes a significant difference in calculation of environmental benefits. It also depends on factors like the feedstock (soybean oil, palm oil, animal fat, etc.) used in the production of the biodiesel. Visit <http://www.uiweb.uidaho.edu/bioenergy/ALCACLCA.pdf> for more information.

Additional information

Continue reading the factsheets in this series or visit the eXtension Farm Energy Biodiesel Web page at <http://www.extension.org/pages/28783/farm-energy-biodiesel-table-of-contents>.

You can also find more information on biodiesel fuels in the following MU Extension publications:

- G1990, Biodiesel Fuel: <http://extension.missouri.edu/pl/G1990>
- G1991, Biodiesel Blends for Fueling Diesel Engines: <http://extension.missouri.edu/pl/G1991>

Original work created by Montana State University Extension and the University of Wyoming.

Adapted with permission by University of Missouri Extension.