



# Dakota Rural Action

PO Box 549, Brookings SD 57006  
Phone: (605) 697-5204 Fax: (605) 697-6230  
Email: action@dakotarural.org

## Biofuels: Powering the Future

### Biofuels 101

Biofuels are renewable fuels that are made from plants rather than petroleum. Ethanol is an alcohol typically made from plants and is blended with gasoline. Biodiesel is a fuel made from plant or animal oil and can be used as an alternative to petroleum diesel, but is more often used in a blend. Both kinds of biofuels are clean burning, reduce our dependence on petroleum products, and reduce greenhouse gas emissions.

At this time, biofuels do not entirely replace gasoline or diesel; they are blended with them to replace a percentage of those fuels. Ethanol is sold primarily as a 10% blend; though E85 (85% ethanol) has emerged on the market in recent years. Biodiesel, though it can be used on its own in some cases, is normally available at the pump in a 2% or 5% blend. A 20% blend is becoming more common with some agencies or institutions that can blend their own; however, it's not yet available at pumps. Consumers who mix their own blends can blend at higher levels as well. Farmers are also beginning to explore on-farm production of biodiesel.

Biofuels provide our farmers another market for their crops. Furthermore, the production facilities for biofuels can keep dollars circulating within the community.

### How Biofuels are Made

Conventional ethanol production involves fermenting sugars from corn, sugar cane or other plants. *Cellulitic* (or *cellulosic*) ethanol is produced from woodier plants and waste organic matter. Enzymes or bacteria are used to convert cellulose to sugar, which is then fermented and turned into ethanol. Biodiesel is produced through *transesterification*, during which glycerin is separated from the oil. The byproducts are biodiesel and glycerin, which can be used in other products.

### Are Biofuels Efficient?

The energy efficiency of farming and of biodiesel and ethanol technology have improved over time; thus, the energy balances of biofuels production have also improved. (The *energy balance* measures how much energy is produced, compared to how much energy is required to grow plants and produce the fuel.) Furthermore, the old argument that it takes more energy to produce ethanol than ethanol puts out has been proven incorrect. According to USDA, a gallon of ethanol yields 34% more energy than is required to produce it. A gallon of biodiesel yields 220% more energy than is used to produce it. Conventional gasoline and diesel use about 20% of the energy in the oil in drilling, refining, and transporting.

### Do Biofuels Really Reduce Our Dependence on Oil?

Yes, biofuels replace a percentage of fuels derived from petroleum. Now that higher blends are being developed, we can look forward to using more renewable fuels and phasing out fossil fuels. Since renewable fuels will not run out, they are an energy source we can count on into the future. As the equipment used to make biofuels are increasingly able to use biofuels themselves, eventually fossil fuels are less necessary to run tractors and other equipment, making the whole energy production a more sustainable and cleaner industry.

### Making a Difference for Farmers

As demand for biofuels grows, so does the need for *feedstock*, the plants used to make them. Farmers will have new markets for their crops, making farming more profitable. However, in order to have a diverse production of biofuels, it's important to find new crops from which fuel can be made. Currently in the U.S., ethanol is made primarily from corn. However, limiting production to just corn hampers ethanol production in other areas of the state and nation. Research into other plants, such as switchgrass or even woodchips, will help spread ethanol production over a larger area and benefit more communities.

### Did you know?

**In 2005, there were 3.9 billion gallons of ethanol produced in the U.S.**

**U.S. biodiesel production weighed in at 75 million gallons in 2005.**

**There are 4 billion gallons of waste cooking oil produced yearly in the U.S.**

**While biodiesel and ethanol produce more energy than it takes to make them, petroleum fuels actually use 20% of their own energy in recovery, shipping, and refining.**

**South Dakota drivers use 400 million gallons of gas per year; 54% of which contains ethanol.**

**Nationwide, only 30% of gas is blended with ethanol.**

