Agriculture and Agriculture et Agri-Food Canada Agroalimentaire Canada

Biodiesel keeps engines of agriculture chugging along

Biofuels offer a great opportunity for reducing our dependence on fossil fuels. Made from renewable resources, biofuels also have the virtue of burning cleaner, thereby producing fewer greenhouse gas emissions. The Government of Canada is committed to securing the nation's position as a world leader in the growing biofuels sector. In keeping with this forwardlooking strategy for a clean and sustainable energy supply, Agriculture and Agri-Food Canada (AAFC) provides programs and services to bring the benefits of this new industry to the agriculture sector and to all Canadians. A key biofuel for the agricultural sector is biodiesel. Here's a biodiesel overview:

Biodiesel Production

Biodiesel is made by a process called transesterification which produces two products: glycerin, which can be used to make products such as soap; and methyl ester, the chemical name for biodiesel. The other notable biofuel is ethanol, which is also made from renewable resources. The chief differences with ethanol are that it's made by fermentation, and it's used in gasoline engines. Ethanol can be manufactured from grains such as corn or wheat, but can also be made from plant fibers in plant residue such as straw (cellulose ethanol).

Biodiesel Tractor Plows into Research

AAFC has designed an instrumented research tractor that's being used for biodiesel research. Biodiesel is made from domestic renewable resources such as vegetable oils, waste restaurant grease, or rendered animal fats. It is usually blended with petroleum diesel. The specially equipped tractor is outfitted with numerous sensors and an on-board computer to measure factors such as engine speed, drawbar pull, wheel slippage, fuel consumption and even engine emissions. For the biodiesel studies, the tractor has been outfitted with auxiliary fuel tanks which let the research team switch fuels in the field to do side-byside field tests of different biodiesel blends.

What's Your Blend?

The biodiesel used in most engines is typically a blend of petroleum diesel and biodiesel. A blend of 20% biodiesel and 80% petroleum diesel is referred to as B20. Blends available commercially usually range from B2 (2%) to B20 (20%). AAFC scientists have tested blends from B5 to B100 that have been made from canola, tallow and waste restaurant grease. Results to date have shown a slight increase in fuel consumption when using biodiesel, due to its slightly lower energy content. But despite these results, the B5 blend still gives tractor performance that's virtually the same as petroleum diesel, but with fewer greenhouse gas emissions.

The Green Advantage

Research has shown that engines burning biodiesel produce fewer harmful emissions than those using petroleum diesels. Engine emission tests have shown that biodiesel results in substantial reductions in unburned hydrocarbons, carbon monoxide and particulate material.

