



from Farm to Fuel

Canola-based biodiesel can help the environment.

A biodegradable and renewable fuel, biodiesel has impressive human health and quality of life attributes.

Air Quality and Human Health

Use of biodiesel can help improve urban air quality by significantly reducing emissions of sulfur dioxide, carbon monoxide and particulate matter. Reduced emissions may help offset the health risk associated with the inhalation of air pollutants found in diesel exhaust. Using biodiesel will improve air quality by reducing most emissions¹, including:

- Poisonous carbon monoxide by 50%;
- Ozone forming unburned hydrocarbons by 93%;
- Smog producing particulates by 30% and,
- Acid rain forming sulfates by 100%

According to the Centre for Disease Control's Agency for Toxic Substances and Disease Registry (ATSDR)², polycyclic aromatic hydrocarbons (PAH) are a group of compounds formed during the incomplete burning of fuels including conventional diesel. PAH's have been linked to lung, stomach and skin cancers. Biodiesel is essentially free of PAH's.

Water quality

Biodiesel is highly biodegradable, making it an environmentally sound choice for preservation of water quality. Studies show biodiesel biodegrades four times faster and to a greater extent than conventional diesel³. The degradation rate of petroleum diesel is tripled when blended with biodiesel.

The environmentally favourable quality of biodiesel is leading to growing interest in its use at port facilities in densely populated regions. In addition to biodegradation properties, the use of biodiesel and biodiesel blends results in a reduction in exhaust odour and easier boat cleanup due to production of less particulate matter or 'soot'. Washington State Ferries, the largest ferry system in the US, is committed to using biodiesel as a major tool in its commitment to reduce air pollution in the Puget Sound⁴.

Greenhouse Gas Emission Reduction

The transportation sector represents an ever-increasing source of Greenhouse Gas (GHG) emissions in Canada. One recent study forecast that, by 2020, emissions from transportation would exceed 1990 levels by 40%⁵. The accelerated use of biofuels such as biodiesel is seen as one way to reduce the GHG emissions of this sector.

Of the six greenhouse gases of most concern, carbon dioxide is deemed to be the most important one released by human activities because of the large quantities produced through the burning of fossil fuels. Canola biodiesel provides a "made-in-Canada" solution that may help reduce the net amount of carbon dioxide in the biosphere. The US Department of Energy found biodiesel production and use produced 78% less carbon dioxide emissions than petroleum diesel, in part due to the 'carbon recycling' of the carbon dioxide used during production of the canola seed⁶.

In addition to helping reduce carbon dioxide levels, studies in Germany indicate that biodiesel made from oilseed rape supplies three times the energy expended in its manufacture⁷.

Biodiesel is known to emit more nitrous oxide (NOx) than conventional diesel, but research with fuel additives shows the potential to reduce NOx emissions to 5% exists⁸.

Safe Alternative

In comparison to other fuels, biodiesel is safer to store and handle. At 260 degrees F, the flash point (the temperature at which the fuel vapour can ignite) for biodiesel is well above the flash point for conventional diesel (125 degrees F). The lower the flash point, the easier it is to ignite the material. Testing indicates that the flash point of biodiesel blends also increases as the percentage of biodiesel increases⁹.

¹ Hogan, NR Canada "Biodiesel Basics" 2005

² ATSDR "ToxFAQ's for polycyclic aromatic hydrocarbons (PAH)" 1996.

³ National Biodiesel Board "Environment and Safety Information" 2006

⁴ Washington State Department of Transportation "Clear Sailing Ahead" 2004

⁵ (S&T)² Consultants Inc "Economic, Financial, Social Analysis and Public Policies for Biodiesel, 2004

⁶ http://www.eere.energy.gov/afdc/altfuel/bio_benefits.html

⁷ UFOP "Biodiesel Facts, Arguments, Tips" 2003

⁸ National Biodiesel Board "Study shows NOx emissions reductions in biodiesel blends with additive" 2004

⁹ National Biodiesel Board "National Low Blend FAQ" 2006