

Nick Bray

Kemptville College cruising forward on Biodiesel.

So Simple! So Green!

This has been a very exciting project for Kemptville College – started as a simple student project, developed into a serious research initiative, and gained the support of government and industry because of its environment, industrial and commercial potential. An additional six Ontario Soil and Crop Improvement Association member farms across Ontario will evaluate bio-diesel at 5% in their farm equipment. Partners in this endeavor are: Natural Resources Canada, Agriculture and Agri-Food Canada, Environment Canada, Ontario Soil and Crop Association, John Deere, and Kemptville College. The 5% bio-diesel is provided by UPI Energy.

As part of research initiative, Kemptville College Agriculture Equipment Technician Allan Smith negotiated with John Deere for the generous donation of a new 5325, 55 horsepower tractor for field testing on bio-diesel. Allan supervises its operation and regularly monitors fuel quality. Upon completion of Phase Two (2007), a thorough analysis of the engine performance will be conducted.

To date, continued testing has been highly successful, and a B5 blend (5% oil from animal rendering, however currently moving towards a canola based product) was settled on as the fuel for continued field testing, since it met manufacturer's regulations and is viable for continued production. Long term industrial and commercial use represents significant environmental gains through emission reduction and lower dependency on non-renewable fuel sources.

Ben Hawkins, M.Ap.Sc., P.Eng, Research Stations Operations Manager, was eager to provide assistance, both in advisory and hands-on capacities. As well, the Emission Test Center expressed an interest in continued involvement with ongoing emission testing, and Natural Resources Canada offered to provide a fuel source for testing purposes that would meet with industry specifications. Kemptville College then partnered with a parallel project initiated by Agriculture and Agri-food Canada

What is Bio-diesel fuel?

Bio-diesel fuel is created through a chemical process called "transesterification," whereby glycerin is separated from a fat or vegetable oil. The process leaves behind two products - methyl esters (the chemical name for bio-diesel) and glycerin (a valuable byproduct usually sold to be used in soaps and other products).

Bio-diesel is a clean burning alternative fuel produced from domestic, renewable resources. Although it contains no petroleum, it can be blended at varying levels with petroleum diesel to create a bio-diesel blend. Bio-diesel can be used in compression-ignition (diesel) engines with no engine modification required. Bio-diesel fuel has many benefits – it is simple to use, it is biodegradable, nontoxic, and significantly lower in sulfur and aromatics levels.

What are the benefits?

Bio-diesel is better than petroleum fuel for the environment because it is made from renewable resources and has lower emissions. It is actually less toxic than table salt and biodegrades as fast as regular sugar. Since it can be made from renewable resources like soybeans, canola, and animal renderings, its application as a fuel decreases dependency on foreign oil and contributes to the Canadian economy through its agricultural production and processing.

A study conducted by AUS Consultants shows that realizing a national goal of 4 percent renewable fuel use by 2016, would increase soybean production from 51 million bushels in 2002 to 318 million bushels by 2016. Soybean prices would increase an average of 68 cents per bushel, or 11.8 percent of the baseline.

In another study, completed in 2001 by the U.S. Department of Agriculture's Office of Energy Policy and New Uses in conjunction with the Economic Research Service (ERS) found that an average annual increase of the equivalent of 200 million gallons of soy-based bio-diesel demand would boost total crop cash receipts by \$5.2 billion cumulatively by 2010, resulting in an average net farm income increase of \$300 million per year.

Their research project was originally conducted under the guidance of Kemptville College staff, Allan Smith, Wendy Asbil, and Veijo Manner.

For more information contact Kemptville College staff: Allan Smith, Ben Hawkins

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