

### 5. Canola

#### 5.1 Background

Canola is a member of the *Brassica* Family, which includes broccoli, cabbage, cauliflower, mustard, radish, and turnip. It is a variant of the crop rapeseed. Grown for its seed, the seed is crushed for the oil contained within. After the oil is extracted, the by-product is a protein-rich meal used by the intensive livestock industry.

#### 5.2 Results

At present canola oil, per se, is not an automotive fuel, thus no results are presented because no results are available.

#### 5.3 Viability and Functionality

The power output and tailpipe emissions using plant or animal oils are in most cases comparable with the power output and the emissions when running on petroleum diesel fuel, the main problem encountered has been the higher viscosity of the oils causing difficult starting in cold conditions, the gumming up of injectors, the coking-up of valves and exhaust, and the often high melting or solidification point of many vegetable and animal fats and oils. High melting points or solidification ranges can cause problems in fuel systems such as partial or complete blockage as the oil thickens and finally solidifies when the ambient temperature falls. The engine can quickly become gummed-up with the polymerised oil. With some oils, engine failure can occur in as little as 20 hours.

Only coconut oil has an iodine value low enough to be used without any special precautions in a unmodified diesel engine. However with a melting point of 25°C, the use of coconut oil in cooler areas would obviously lead to problems.

All of these problems can be at least partially alleviated by dissolving the oil or hydrogenated oil in petroleum diesel. Linseed oil for example, could be mixed with petroleum diesel at a ratio of up to 1:8. Likewise coconut oil can be thinned with diesel or kerosene to render it less viscous in cooler climates. Another method is to emulsify the oil or fat with ethanol.

#### 5.4 Health Issues

The health issues associated with the use of canola oil in a diesel engine are not known.

#### 5.5 Environmental Impact and Benefits

The environmental issues associated with the use of canola oil in a diesel engine are not known. If diesel vehicles were modified to run on straight vegetable oils then the following environmental considerations would apply.

##### *ESD issues*

Canola is made from agricultural crops and is thus widely perceived to be more environmentally friendly than fossil fuels.

##### *Sustainability issues*

Sustainability is not currently an issue for canola as a transport fuel because there is no demand for it.. Australia has a production land base able to increase canola, though low oilseed prices could restrict expansion.

## Part 1 Summary of Fuels

### *Groundwater contamination*

Not an issue with vegetable crops, except for the possible use of pesticides or fertiliser during their growth.