

Biofuel?

In February last year, the Government set a national target of 3.4 % for the biofuel component of petrol and diesel in 2012. This means that oil companies will have to start offering biofuels from April 1 this year, and the Government has said there will be no excise tax charged on the ethanol. So what does this mean for agriculture? Are there some opportunities? Lets start at the beginning.

What is biofuel?

Biofuel is a generic term for fuels that can be produced from biomass, recently living organisms or their metabolic byproducts, such as manure, forest or crop waste, or even pond scum. Often biofuel is a substitute or partial substitutes for fossil or mineral fuels.

Biofuels used in transport are typically bioethanol which is used as a petrol substitute and biodiesel which is used as a diesel substitute. Biofuels have the major advantage of not contributing to overall greenhouse gas emissions.

Bioethanol is an alcohol made from fermented starches and sugars which is then distilled and has properties that are similar to petrol so it is often blended with petrol. Bioethanol is likely to be introduced as a low level blend, 3-5 % in some petrol, although the current maximum level allowed is 10 %.

New Zealand currently produces sufficient bioethanol from whey, a by-product of the dairy industry, to meet around 0.3 percent of our petrol needs. More bioethanol could be produced from whey or other waste and by-product sources. Maize is one such possible feedstock for bioethanol production in New Zealand. At present, the majority of our bioethanol production is being exported. Australia is also producing bioethanol from processing grains and sugar cane, Brazil from sugar cane and the United States from corn grown specifically for bioethanol production. Total world production is around 40 billion tonnes, 75% is used as fuel. Brazil is the world leader in both bioethanol production and use.

Biodiesel can be produced from any vegetable oil or animal fat and used as a substitute or partial substitute for mineral diesel. Biodiesel is often blended with mineral diesel and blends of up to 5% in mineral diesel are suitable for use in diesel engines without modification.

In New Zealand the biggest source of biodiesel would be from tallow. Currently small amounts of tallow are used here for stock feed and food production, with the majority being exported to the Asian region. At present we produce around 150,000 tonnes of tallow per annum domestically, which would convert to supply roughly about 5% of the country's annual diesel consumption.

The price of biofuel blends and ordinary petrol and diesel will vary depending on the price of oil, the cost of the feedstock from which biodiesel is made, the price of production, and the tax regime applied to them. Biodiesel and bioethanol-petrol blends are unlikely to cost users any more than ordinary diesel and petrol at the pump. It will be up to fuel producers and retailers to set the price. It is possible that the price of all fuels will increase slightly once sales obligation levels mean that both biodiesel and bioethanol blends need to be sold by oil companies, in order to off-set some of the initial costs of getting both fuels to the market. This is likely to occur from 2010.

Biodiesel from tallow and bioethanol from whey are economically viable, but together can only meet around 2-3% of New Zealand's transport fuel demand. It seems at the moment only bioethanol from sugarcane and biodiesel from waste fats (tallow) and oils remain cost competitive in a high oil price environment (though feedstock price increases could also occur).

In New Zealand the question of land availability for growing specialist energy crops revolves around competitive prices for traditional pasture and crop products. If for example the export value of milk products declined but the import price of oil rose significantly, then from a national perspective we could be better off producing biofuels than processing milk products to earn export revenue in order to pay for our imported oil. Analyses of what oil price could trigger such radical land use changes have not been undertaken.

Integrated production of food, fibre and energy crops also needs to be evaluated. Oilseed rape for example not only provides oil for biodiesel, a high protein meal co-product for livestock feed but also straw that can be used for heat, short fibre paper pulp or even ligno-cellulosic feedstock for bioethanol. The current generation of biofuels is derived from the sugar, starch and oil elements of traditional food crops such as sugar beet, oilseed rape, sugarcane, corn, wheat, palm oil and coconut. They thus compete directly with food and fibre production for agricultural land and resources. Future genetically modified species could provide higher yields and be more easily processed into biofuels. Research work is being undertaken by several companies and cheaper biomass production may result in the longer term. In New Zealand the production of GM energy crops may, after extensive testing and evaluation, become more acceptable than would GM food crops.

Why is the government considering a biofuels sales obligation?

The government is committed to the use of renewable transport fuels to reduce environmental impacts of the use of fossil fuels, and to reduce New Zealand's dependence on imported transport fuels.

The National Energy Efficiency and Conservation Strategy's Renewable Energy Target, released in October 2002, included an indicative target for renewable energy for the transport sector of 2 petajoules, equivalent to about one percent of current transport energy use. Despite having had an indicative renewable transport fuel target for three years, and the price of oil currently being high enough for biofuels to be cost competitive, there are still no transport biofuels being used in commercial quantities in New Zealand.

It is clear that market forces alone are not enough to encourage the supply and use of renewable transport fuels.

