

Making Sense of Biofuels

Introduction

Since the UK government announced its intention to introduce a Renewable Transport Fuel Obligation (RTFO) in November 2005, the prospect of a developing biofuels market in the UK has led to much speculation about what this will mean for cereal growers, processors, manufacturers, retailers and consumers. This fact sheet is intended to present information and correct some of the current misconceptions about biofuel production.

Biofuels and Land Use



It has been suggested that there is not enough land to produce cereals for use in traditional food and drink production and for biofuels. Overall, the issue of having enough land for growing cereals is a global one which will require a global solution. The potential for additional planting and for more efficient yields exists in areas of the world such as Eastern Europe and Africa. If prices increase on the world market, the commercial viability of growing grain in many areas will increase.

With changing market conditions and increased demand there is no commercial reason for set-aside to continue. In the EU alone there is a total of five million hectares of land in set-aside with the potential to grow around 40 million tonnes of cereals.

In the UK, the RTFO means that the fuel companies will gradually have to increase the percentage of biofuels used in their products (diesel and petrol). This will start with 2.5% for 2008/9 rising to 3.75% in 2009/10 and finally reaching 5% in 2010/11.

The amount of biofuel which is included with normal petrol and diesel can be calculated in two ways: by volume, and by the amount of energy it contributes to the final mix. The UK Government has chosen to specify a figure of 5% by volume, which will contribute around 3.5% by energy. Organisations, including the NFU, have called on the Government to make a commitment to continue to increase this to around 7.5–8% by volume. This would equate to 5.75% by energy, which is the target level set by the EU.

If it is assumed that the cereals necessary to deliver the initial 5% figure are all produced domestically, estimates show that this will certainly be achievable given the following:

- Plantings have reduced over the last few years and would increase given a favourable market.
- Some set-aside will be used. However, not all set-aside will be appropriate for growing cereals for biofuels. Part of the existing set-aside will be maintained and will help to preserve biodiversity.
- Crops grown for biofuels will be 'multi-functional': both bioethanol and biodiesel processing will produce co-products that will be used as animal feed. This will mean that fewer crops have to be grown for this purpose.

- The UK currently exports around 3 million tonnes of wheat every year, and a large percentage of this could be used for biofuels production.

In the medium term yields could be increased, especially given that:

- Grain for ethanol needs to be high in starch rather than protein.

HGCA, for example, is one of a number of organisations involved in the 'GREEN Grain' project which aims to develop wheat for ethanol production with reduced fertiliser input.

Food or Fuel?

Naturally people are concerned about the potential use of millions of tonnes of cereals and oilseed to produce fuel, when people are starving in countries all over the world. Surpluses have existed in certain parts of the world for some time, but sadly this has made little or no difference to the overall situation.

As outlined above the potential to produce additional crops to make biofuels does exist without affecting supplies to any market. Some experts believe that the development of biofuels, and changing market conditions may create a situation in which biofuel crops can be grown in developing countries and, therefore, help rather than hinder their self-sufficiency.

Second Generation Technology

In the longer term, lignocellulosics may offer a solution to the world's needs for transport fuels. However, while it has been proven that substances such as straw, wood and even waste paper can be used to produce ethanol, this cannot yet be achieved on a large-scale commercial basis. Using existing feedstocks and proven technology to produce ethanol will establish an industry which can be converted to these 'second generation' technologies when they become commercially viable. In order for the biofuels market to develop, progress will have to be made with all options, including well-established techniques to produce biofuels and second generation technology.

Biofuels and World Grain Markets

There is already some evidence that the increasing production of biofuels and the planned developments in the UK are one of a number of factors influencing grain prices. Other factors which affect the price of cereals and oilseeds include weather, stock levels, production and demand, as well as the opening of new markets. (HGCA operates a programme to help both growers and processors implement risk management strategies to minimise the impact of market movements.)

Market mechanisms mean that these increases in prices will lead to more cereal plantings on farmland over the next few years. It is also likely that UK exports will decrease. This should increase returns to growers while also increasing the amount of grain on the market.

Effects on the Price of Food

There has been some concern that the increased price of raw materials, such as wheat or oilseed rape, will have a major impact on food prices. As indicated above, it is likely that the market will respond to increased demand by producing more grain, however this will undoubtedly be at a higher price. This should be viewed against a background of relatively low prices during recent years, with growers operating on very thin margins.

The ex-farm price of cereals is an extremely small percentage of retail product prices, and, as such, is highly unlikely to lead to significant increases to consumers. In fact, all the evidence of recent years is that consumers will continue to enjoy relatively cheap food. A recent article in *Checkout* magazine by Jonathan Banks, Business Insight Director at AC Nielsen, said that two-thirds of the FMCG categories which they had analysed showed a lowering of prices per kilogram or per litre during the past three years.

The Cereals Industry Forum, founded by HGCA and the Food Chain Centre, has been undertaking considerable research to encourage better communication in food supply chains. By ensuring that growers, processors, distributors and retailers are communicating successfully, supply chains can be made more efficient – reducing risk to all parties, but also reducing the likelihood of sudden price increases.

Greenhouse Gas Savings

Suggestions have been made that biofuels may not deliver the savings in greenhouse gas emissions that have been promised. Calculations will vary depending on various aspects of biofuels production process, feedstock used, and the way in which the assessment is made. However, work carried out for HGCA has indicated the significant scope for savings.

A research study into the environmental impact of growing wheat and oilseed rape for biofuels conducted by the Central Science Laboratory (CSL) concluded: “Compared to fossil-derived petrol, bio-ethanol from wheat has the potential to reduce energy inputs by 61% and total greenhouse gas emissions by 65% for each MJ of energy created. Similarly, rape methyl ester (bio-diesel from oilseed rape) has the potential to reduce energy inputs by 66% and total greenhouse gas emissions by 53% for each MJ of energy created.”¹

Research in this area has also been conducted for North East Biofuels in collaboration with the Low Carbon Vehicle Partnership (LowCVP)². It studied the energy, carbon emission, and greenhouse gas emission savings made from producing and using biodiesel compared to ultra-low sulphur mineral-based diesel. Depending on whether the co-products from the production process are used as animal feed, or to produce electricity through co-firing at a power station, this analysis showed the following savings:

	Energy Savings	Greenhouse Gas Emission Savings
Animal Feed	57%	38%
Co-Firing	97%	57%

However, the potential for greenhouse gas savings will not signify anything if it cannot be demonstrated and independently verified. Both the European Commission and UK Government have indicated that a method of independent certification will form an important part of their biofuels strategy. Confirming the details of the RTFO in the April 2006 Budget Statement, the UK Government announced that it had asked the Low Carbon Vehicle Partnership to lead work looking at the issue of carbon and sustainability assurance.³

HGCA is now contributing to this work and further developing the research it has conducted into how accreditation might be applied to biofuel production. This has included:

- The CSL review of the environmental impact of growing wheat and oilseed rape for biofuels.¹
- Research into how a bioethanol accreditation scheme might work, involving a number of interested non-governmental organisations (NGOs), together with Imperial College, London and the Edinburgh Centre for Carbon Management.⁴
- Development of a greenhouse gas calculator as part of the above, to enable calculations to be made of reduction of greenhouse gases produced during the whole lifecycle of UK-derived biofuels, relative to traditional fossil fuels.
- On-farm trials to demonstrate how carbon savings would be audited during the growing of crops for biofuels, using existing audit schemes.

HGCA is currently working with Imperial College, London on further refinement of the greenhouse gas calculator.

Overall there is confidence that, in order to qualify for the RTFO, biofuels grown and sold in the UK will deliver significant savings in greenhouse gases.

Environmental Damage from Growing Crops for Biofuels

There are some concerns that while biofuels may be good for the environment by reducing greenhouse gas emissions, growing crops for biofuels in this country and abroad will have a negative effect on the local environment, particularly flora and fauna. HGCA has worked closely with organisations such as English Nature, RSPB and Friends of the Earth on the research into the development of reporting schemes, and both the European Union and the UK Government have made a commitment to biofuels being eventually audited for sustainability as well as carbon savings.

The review conducted by CSL¹ concluded that there was no significant difference in the environmental impact of growing wheat or oilseed rape for fuel compared to food. It does say that growing crops for biofuels on set-aside land would have a negative impact. However, this is mitigated by three factors:

- Not all set-aside would be used for growing crops.
- The study by CSL and other work such as the GREEN grain project provide a template for growers to adapt new practices to considerably reduce environmental impact.
- The implementation of carbon assurance on-farm will ensure that growers follow environmentally friendly practices such as ensuring that nitrogen inputs are appropriate.

It is anticipated that the additional audits required for farmers growing crops for use in biofuels production will not add to the current burden of administration. Trials conducted by HGCA for on-farm carbon assurance showed that this audit could be simply added to existing farm assurance schemes and required little additional data. Information on environmental impact could also use much existing data and might be similar to the kind of reports used for schemes such as Entry Level Stewardship.

It is important to note that any feedstock or biofuels imported into the UK would also be subject to equivalent reporting for carbon savings and sustainability.

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Notes

¹ An Assessment of the Potential Environmental Impacts Arising from Cultivation of Wheat and Oilseed Rape for Liquid Bio-fuel Production. Central Science Laboratory. January 2005

² Assessing a biofuel supply chain: A north east of England case study

³ UK Treasury 2006 Budget Report. Paragraph 7.68 April 2006

⁴ Developing Carbon and Greenhouse Gas Assurance for Bioethanol Production in the UK by Peter Billins, Jeremy Woods and Richard Tipper. November 2005

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