

Minutes of the OREGIN Stakeholder meeting

Focus on Rapeseed as a Biofuel

7th March 2007

Warwick HRI, Wellesbourne

A series of presentations providing an update on the progress of the OREGIN project was given by members of the OREGIN project team:

Dave Pink (WHRI) – Chairman	A brief introduction to OREGIN
Graham Teakle (WHRI)	Development of core plant resources
Olu Latunde-Dada (RRES)	Development of pathogen resources
Neal Evans (RRES)	Dissemination of resources and information
Graham King (RRES)	Networking in the wider <i>Brassica</i> community

A series of invited speakers gave presentations on the theme of “**Biofuels and oilseed rape – second generation?**”

Bob Saunders (BP)	Carbon Accreditation Schemes
Elaine Booth (SAC)	A comparison of alternative UK biofuel crops
Mairi Black (HGCA)	Carbon emissions from liquid biofuels
Ian Waller (Five Bar Gate)	Renewable Transport Fuel Obligation Carbon and Sustainability reporting requirements

The Powerpoint presentations given in each of these talks will be made available from the OREGIN website (<http://www.oregin.info/index.php?area=Stakeholders&page=shf5>)

In addition to the talks, the floor was opened for a discussion of the political and social economics of biofuels. A brief summary of the points raised during the discussion is given below:

Oil production and trading

- Plant oils for use as biodiesel are likely to be traded as a commodity. This means that rapeseed oil will be competing with other cheaper alternatives, such as palm and castor oil.
- However, palm oil is often not produced sustainably, due to clearing forests to make way for plantations. This is a significant ethical consideration for biodiesel production as it will affect the image of companies which use it.
- Palm oil will be acceptable if from plantations created prior to 2005, i.e. 2005 is the “the line in the sand” for acceptability
- It is expected that rapeseed oil will be traded on the commodity market, unless differentiated forms are in demand
- In the food oil industry price is the main driver, rather than carbon accounting
- To grow OSR to meet the UK’s biodiesel needs of 5% by 2010 will require a large increase in OSR acreage (possibly an additional 600 kHa). This may be partly achievable by the displacement of other crops and use of set-a-side land. However, it is doubtful that the UK could accommodate the full amount.
- For the UK there are likely to be issues of ‘displacement’ whereby production of biodiesel would need to be considered against energy cost of food imports

- Alternative locations for OSR growing for biodiesel were suggested as eastern Europe where there appears to be substantial tracts of available land
- In Brazil and USA bioethanol from sugar cane and maize respectively is the major biofuel, while in Europe it is biodiesel. In the US, the life cycle energy input/output from maize is marginal, and in some cases negative !
- The current high inputs in European OSR production means reduced C efficiency compared with other oils, but it does have good sustainability in that it is being grown on existing farmland
- There has been the seemingly “bizarre” cases of olive oil being shipped to the UK for use as biodiesel

Breeding and trialling

- Genetic improvement is considered as a viable approach to reducing the carbon footprint of oilseed rape. However, breeders are currently producing new lines optimised for the statutory NL and RL trialling systems. This is necessary to obtain a licence to sell a variety and because farmers largely select varieties based on the performance evaluations of these trials. The problem is that these trials are carried out under high input conditions (fertiliser and pesticide). This represents a major obstacle to R&D and crop improvement. There is thus a conflict between government (&EU) targets for low input/sustainability and the government (EU) statutory framework for variety release. The statutory systems were established for major arable food crops, and unfortunately also impinge on non-food use. This is not a requirement for other biofuels such as SRC willow, or Miscanthus.
- Trialling conditions are governed by European National Listing legislation. This is therefore difficult for a member government to make unilateral changes
- There is also a UK-specific problem in that VCU tests for RL listing are performed under high input conditions. In Europe trialling is performed under lower input conditions.
- For cost and energy efficiency, the main objectives would be to reduce fertiliser and fungicide inputs. However, this is likely to have a yield penalty. Modelling of the relationships between these would be beneficial.
- Low establishment is the single biggest issue that needs to be addressed to improve yields. This may be helped by using low tillage growing which leads to better soil moisture retention and may also help to reduce N usage
- One possibility is that RL trials could incorporate N and C ratings
- Low input crops are currently more expensive as the yield are low
- It may be that the crop with the best C efficiency is the most desirable. This may be a crop with a lower yield/Ha which has been grown under low input conditions.

However, this will detract from the requirement to UK total yield necessary for Biodiesel targets.

- Breeders are also up against the problem that it takes 8-10 years for new properties to appear in new varieties, but government policy tends to shift in shorter timescales. Therefore, it is more difficult to get governments to commit funding for these sorts of timescales.
- Trialling is performed on a species basis, but there is no differentiation between the species in terms of selling the end product in the commodity market
- There is a requirement from fuel distributors for molecule optimisation to ensure that biofuels are suitable for modern efficient engines - this is not necessarily achievable for bioethanol, but could be for biodiesel or other liquid feedstocks. This seems to be a particular opportunity for R&D underpinning OSR improvement.

International considerations

- There are discrepancies between European countries on subsidies for growing crops for energy
- In Denmark farmers are permitted to differentially use their N allowance (more clarification required)
- Germany is the leading producer of biodiesel in Europe. Germany has set rigorous standards for their biodiesel, including sustainable production. They do not allow imports of oils that don't meet these standards. Other countries have different standards. A knock on effect of German production diverted to biodiesel has been insufficient supply for food (margarine) manufacture. This could represent an opportunity for the UK to focus on quality products, given land limitations.
- In the UK rapeseed yields have remained virtually constant over the last 30 years (approx 3.3 t/ha), despite continual improvements in the NL and RL trials (over 5 t/ha). This is partly due to many farmers using farm-saved seed. In Germany, however, almost 100% of farmers use certified seed. This, in part, leads to better establishment and lower seed rates can be used.

Other points

- OSR is a depressing crop for a farmer to grow due to uncertainty of yield, i.e. one year may be very good whilst the next may be poor
- One possible contributor to this that has received little attention is virus infection. This either doesn't present itself as an obvious phenotype or is often considered as a mineral deficiency etc. However, screens for viral infection have found it to be widespread with often 100% infection rates in some areas. There are varying reports as to the degree of yield penalty that results from virus infection, but it is likely to be greater than 10%
- There are benefits to using a food crop for industrial purposes as it provides flexibility for a farmer to sell in a different market if the alternative market is unfavourable. In addition, as OSR is grown on an annual basis it doesn't require the longer-term commitment that is required with other bioenergy crops, such as miscanthus and short rotation coppice willow.