

BIOMASS AND ENERGY CROPS III

Defra's Central Science Laboratory

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As the title suggests, this was a sequel to previous conferences held by the AAB on this topic in 1997 at the RAC, Cirencester, and in 2001 at the University of York. As in previous years, the conference attracted a lot of interest, including overseas interest, and the organisers had no difficulty in filling the three day programme from the offers received.

Topics of interest ranged from examples of bio-energy developments in Europe. The bioenergy problems faced by the UK's more remote islands were also highlighted in a couple of papers from Orkney-based authors, with such islands reliant on costly imports of oil for energy.

In addition to the more commonly covered biomass crops, others of interest at the conference included grass, maize, sorrel and green manure crops, in this case for anaerobic digestion (AD) to produce methane.

Paul Temple kicked off the conference in forthright style, highlighting the NFU's interest and support for bioenergy and the key opportunities that bioenergy offers for UK growers. However, he also highlighted his own concerns relating to the drivers and paucity of research to support the key issues over land-use change expressed in the Gallagher review. The NFU also has a vision to establish 1000 on-farm AD units by 2020 and a further 100 waste to AD units. It has also established its own perennial energy crop group to lobby Government and is supporting and developing sustainability standards for bioenergy fuels. Policy review papers highlighted the current piecemeal nature of support for bioenergy, though the developments in banding of the Renewables Obligation in the UK from 2009 was seen as one area where biomass was set to receive specific positive support, though movements on support for renewable heat are more keenly awaited.

In an interesting twist on bioenergy production, Christoph Strauss from Germany demonstrated how rotations could be designed to optimise biomass production from annual cropping and double cropping, by integrating both food and fuel crops for AD within different crop rotations.

As with all novel crops where there is no official recommended list trialling, it is difficult to obtain reliable information on yield potential. Simon Kightley from NIAB highlighted the problem and identified the few reliable data sets that were currently available (though with high levels of statistical variability) and highlighted work NIAB had undertaken with growers to obtain a greater range of data. However the problem with perennial energy crops is that cultivar turnover is slow and current yields reflect older cultivars - newer cultivars offer improved yield potential. Alistair McCracken (who has now presented at all of the events in the AAB's biomass series!) presented the results of trials work introduced at the previous conference, to show that some cultivars perform better when planted in diverse genotype mixtures than when planted alone; an effect that was observed over a number of harvest cycles.

Ian Shield reported on work to identify the key parameters for success producing propagating materials to optimise subsequent SRC willow establishment. The following discussion revealed that industry was in some cases falling far short of the optimum in the range of

materials currently being offered as planting materials. Ian also reported that *Miscanthus sinensis* could be established from seed, reducing establishment costs, however the extended time taken to reach commercial yield means further work is required to optimise this approach.

Several papers identified the benefits of perennial short rotation coppice for bird species, though effects tended to be linked to establishing crops. The value of establishing and mature crop effects on biodiversity need to be clarified to help identify management strategies that could assist the biodiversity value of energy crops. Both crop management options and the role of 'rides' left in established crops were identified as means by which the added biodiversity benefits of perennial energy crops could be recognised in return for more public support through agri-environment schemes

Papers on wheat for bioenergy from ADAS highlighted that there is still a lack of basic information on grain components, even in relation to basic constituents like starch where results differ for the range of routine analysis methods available. Predicting alcohol yield is therefore not clear cut and other grain components are likely to have an impact on conversion efficiency which means that predicted yields are rarely achieved in practice. Richard Weightman also reported on work in progress to utilise arabinoxylans as by-products from ethanol refineries. It was disappointing and somewhat surprising that there were no offered papers on the use of oilseed rape for biodiesel, given that this has developed rapidly in the UK and there has been considerable work on the crop.

The conference provided an ideal vehicle for both policy interests, researchers and industry (all of which were represented) to gain an insight into information emerging from recent work in a number of areas; breeding to yield prediction, biomass resource mapping, impacts on the environment and impacts on combustion as well as highlighting problematic areas such as uncertainty in analysis of greenhouse gas savings and future prospects. To drive bioenergy development forward, the UK is going to need co-ordinated programmes of research. Conferences like this help to identify issues in different sectors of the supply and utilisation chain and foster links that will help join up the science and evidence base to help assess and understand the impacts of bioenergy development as well as helping to communicate information amongst peers.

Aspects of Applied Biology, Volume 90, has been produced, containing virtually all the papers from the conference. It is unfortunate that not all speakers were able to produce papers for the proceedings. To be fair to those making the additional effort, organisers of future conferences will need to consider whether to allow presentation in the absence of submission of full papers. Copies of Volume 90 are available from the AAB office. As past volumes of these have proved a valuable resource to those with an interest in bioenergy, I suggest you get orders in quickly for remaining copies!

Given the importance of this topic area, it is hoped that there will be sufficient support and interest to ensure that we don't have to wait for seven years for biomass and energy crops IV!

David Turley, AAB CATE Group 14 December 2008