

Harvester development for new high yielding SRC crops and markets

OBJECTIVES

- To develop harvester drive chain and feeding systems to cope with larger, modern, higher yielding crops.
- To assess, by harvesting sites of different ages of the most recently planted varieties, the most economic harvesting cycle for SRC crops. Focus on maximising machinery and crop output thus minimising delivered cost per tonne whilst still maximising grower return.
- To produce, in one pass, fuel that can be directly fired with coal in pulverised fuel systems.
- To produce, in one pass, large grade fuel suitable for gasification.
- To achieve a harvesting cost of ANY fuel specification of £10-£11/odt.

SUMMARY

Short rotation coppice (SRC) is an under developed industry in the UK. Currently there are around 2,000 hectares (Ha) of crops planted many of which are not allocated to a specific end use. Large-scale markets have emerged mainly driven by



Fig. 1 Self-propelled forage harvester (courtesy of Coppice Resources Ltd)

co-firing. For example, a single 2,000MW coal station, substituting 5% of coal with biomass, will have an annual demand of up to 300,000 oven dried tonnes (odts) or ~30,000 planted Ha of SRC. There are seven UK coal-fired power stations to date that have biomass handling facilities. To meet this potential demand, there is pressure on the capability of harvesting SRC to the market specification, at an economic price.

Latest information from crop breeders and field trials shows that a mix planted in the year 2000 compared to the late 1990s has a yield increase of 30%. The only way that the crop can achieve this is by growing more stems, and thicker, taller stems. Therefore, a SRC harvester has to be able to gather, feed, cut and chip this material.

There are also market sectors that have very different requirements for fuel specification. Trials work that Coppice Resources Ltd (CRL) has been involved with to co-fire large coal-fired power stations has shown that the requirement is for particles of fuel that are 6mm x 3mm x 3mm in size. At the other end of the particle size scale, the gasification industry require a lump of wood that is 50-75mm long and as thick as the crop stem allows – i.e. retaining harvested stems whole as against splitting stems is required.

The goal of this project is to develop a harvesting system for SRC that can, in one pass, produce material to the required specification of an end user at a cost that enables the grower to be profitable and the end user to purchase fuel at a price that they can afford to pay.

CRL and mainstream machinery manufacturers, to meet the needs of the expanding willow harvesting and fuel market, will then aim to exploit the developed technology.

CONTRACTOR

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COST

The total cost of this project is £108,997 with the Department of Trade and Industry (DTI) contributing £27,250 and CRL/Fred Walter & sons the balance.

DURATION

12 months – 1st October 2004 to
1st October 2005

<p>Further renewable energy information from the DTI Technology Programme: New and Renewable Energy, and copies of publications, can be obtained from: <i>Renewable Energy Helpline</i> Tel: +44 (0)870 190 6349 E-mail: NRE-enquiries@aeat.co.uk</p>
