Topic: Energy Crops
Title: Economics of Miscanthus and SRC production

INTRODUCTION

Energy crop production should be considered a long-term commitment. Miscanthus and Short Rotation Willow Coppice (SRC) are perennial crops with an expected productive life span in excess of 20 years. The crops can be grown on set aside land, and if grown on non-set-aside then they are currently eligible for a further £29 per hectare under the Single Farm Payment rules. Each site will vary in terms of preparation costs, likely yield, haulage costs and final product price; hence it is almost impossible to provide definitive gross margins. Therefore, the aim of this sheet is to provide information on the points you need to consider when calculating the economics of production for your own site.

CROP ESTABLISHMENT

This is the key phase for Miscanthus and SRC crops, and it is also the phase associated with the highest costs. Miscanthus is grown from rhizomes and SRC from rods or cuttings. Planting material costs in the region of 6 to 8p per rhizome or cutting. Planting rates are in the region of 15,000 to 18,000 plants/ha, resulting in a cost per hectare for plant material of between £900 and £1,400. Table 1 gives an example breakdown of the cost of planting one hectare of Miscanthus.

Costs for planting of SRC are broadly comparable, although the cost of rabbit fencing may also need to be considered if rabbits are a problem in the area. Neither Miscanthus nor willow competes well with weeds in the first two years making weed control is an essential cost. Whilst the establishment of the crops is relatively expensive it should be noted that the costs should be annualised over the 20+ life span of the crop.

Table 1: Indicative costs of planting Miscanthus

Activity	Costs (£ ha^{-1})
Rhizome costs (@ 18,000 rhizomes / ha)	1,170
Cultivation	83
Herbicides (Glyphosate)	96
Contract planting	300
Total	**1,649**

There is currently no grant support for the planting of energy crops.

HARVESTING

Both Miscanthus and SRC are low input crops that do not require pesticide / fertiliser inputs after the two year establishment phase. As a result harvesting costs are the only other costs to be considered in crop production. It should however, be noted that the crops take 3 to 4 years to reach a harvestable yield. The costs associated with harvesting depend largely upon equipment availability in the area. Miscanthus harvest machinery is more readily available as the crop can be harvested using a mower conditioner, and baled into Hesston bales. Willow harvesting equipment is more specialised and the use of contractors more likely. Willow is harvested on a 3 year cycle: the grower has the option of having an annual harvest of one third of the crop area of a harvest of the whole crop every third year. Miscanthus is harvested every year.

Miscanthus harvesting

Table 2 gives an indication of likely contract harvest costs for Miscanthus, assuming a yield of 14 tonnes per hectare, baled.

Table 2: Indicative costs of harvesting Miscanthus

Activity	Cost (£ ha^{-1})
Mower conditioner	20
Baling (at 16% moisture content)	110
Carting, stacking and loading	40
TOTAL	**170**

REVENUE CALCULATIONS

The revenue that might be obtained from energy crops is dependent on the end market. The best returns can be obtained by growing the crops to supply local energy needs. It must be noted that heat cannot be transported and can only be used close to source. By supplying a fuel it is possible to generate income by becoming an Energy Supply company (ESCO). Biomass fuels are bulky commodities and as a result haulage costs are an important consideration, generally the closer crops are grown to the end process or user the better. Tables 3 and 4, below, provide indicative margins from Miscanthus production, based on different scales of end user.

Table 3: Miscanthus - indicative gross margin – selling to power station

		£ / ha
Costs	Production costs	280
	Haulage (£9.10 / tonne)	127
	Total Costs	**407**
Revenues	Revenue @ £31 / tonne	434
	SFP (additional £29)	29
	Total Revenue	**463**
	GROSS MARGIN	**56**

Table 4: Miscanthus - indicative gross margin – local use

		£ / ha
Costs	Production costs	280
	Bale shredder	42
	Tractor and trailer	56
	Total Costs:	**378**
Revenues	Revenue (@ £40 tonne)	560
	SFP (additional £29)	29
	Total Revenue:	**589**
	GROSS MARGIN	**211**

Current fuel prices paid for wood chip for local heating schemes in Wales are in the region of £35 - £40 a fresh tonne (at 30% mc). As Miscanthus is drier, a value of £40 a tonne has been used. If providing heat to the farm, capital and running costs of a biomass heating boiler (with a grant towards the capital installation) can be equivalent to oil if fuel is purchased at a price of £40 fresh tonne.

CALCULATORS

The costs and revenue from energy crops are very site specific and the tables above only provide an example of possible costs. The Energy Crops Wales website (www.energycropswales.co.uk) provides extensive information on energy crops, including economics and calculators for Miscanthus and SRC production. Default figures are provided that can be altered to suit your own circumstances.