Biomass

Key points to consider

- Short rotation coppice willow for biomass will grow well in Northern Ireland conditions.
- The lifetime of the crop is 20-30 years with a harvesting interval of 3-4 years.
- There are large areas of land in Northern Ireland suitable for biomass development.
- Financial support may be available through the Woodlands Grant Scheme and Guaranteed Set-aside Scheme. Profitability will depend on these payments.
- Biomass offers an environmentally friendly alternative to fossil fuels.

Market overview

Coppice willow is a short rotation crop, grown specifically as a fuel. It offers a significant opportunity as an environmentally friendly alternative to fossil fuels. The market is well established in some Northern European countries. Locally short rotation willow coppice has been grown on an experimental/pilot basis for a number of years.

Current EU targets for the reduction of carbon dioxide emissions under Kyoto Protocol and targets for electricity form renewable energy sources (10% by 2010) provide a strong foundation for the development of renewable energy technologies. In the absence of energy conversion facilities such as wood burning power stations, other potential markets include chipboard manufacture, mulches for equestrian use, landscaping or playground use and bedding for intensive poultry production. Development work on the commercialisation of small scale combined heat and power systems based on gasification are on going. The use of the coppice system for the biofiltration of municipal wastewater is a new area of investigation. The peat powered generating stations in central Ireland could eventually be the market for large volumes of biomass.

Growing willow for biomass production may appeal most to farmers with set-aside land or those who let land in conacre. It is important to establish if the chips can be marketed within a reasonable distance from your farm and at a reasonable price. Before making the decision to go into biomass production you should consider the returns achievable from other uses of the land.

Production requirements

Production of biomass is a long-term commitment and should be planned in detail before beginning. New growers need specialist advice to ensure successful establishment.

Choosing plants

Willow is the popular choice for biomass production in Northern Ireland and in certain circumstances poplar can also be considered. Salix viminalis is the most prevalent species grown in short rotation willow coppice. Since a high yield is the aim it is important to choose highly productive varieties that are resistant to pests and diseases.

Land

Since heavy machinery is used in harvesting in particular you should choose land with access to roads suitable for heavy vehicles.

Mineral soils are required for growing willow. Loam, clay loam and heavy clay are suitable. The pH value of the soil should be between 5.5 and 7.5. Excessive slopes and uneven or bumpy ground present problems to machinery used.

Equipment and labour

For larger plantations it is usual to use contractors to carry out the work involving specialist machinery particularly planting, harvesting and transport of fuel. The grower will generally be involved in soil tillage, weed control, fertiliser application from year two and transporting chips.

During the planting year the amount of labour required from the
The grower will be about the same as for grain production. In subsequent years the grower will only need to give one to two hours per hectare per year. Harvest years will require significant input in crop removal and storage and herbicide/fertiliser application in the period January to April.

**Establishment**

Willow plantations are established with stem cuttings. About 15,000 cuttings per hectare are required and these are planted in the spring.

Before and after planting it is essential to control weeds. This will have to be done by the application of a herbicide. Weed control is considered to be the single most important management input for a successful willow plantation.

Shoots are usually cut back during the first winter to promote a large number of healthy shoots during the following growing season.

**Harvesting**

Harvesting is normally done by contractors in the fourth or fifth year after planting, and every three years after this. It takes place between December and March. In direct harvesting the wood is chipped and loaded into containers for immediate transportation to the buyer. An alternative is to store the harvested wood in which case harvesting can be done in the form of whole shoots. Storing allows the fuel to dry out. One of the factors in deciding which to do is whether or not the buyer can use moist wood chips.

Yields can range from 10 to 12 tonnes of dry wood per hectare per year (30–36 tonnes per hectare on a three year harvesting cycle).

**Terminating the plantation**

Plantations have an economic life of 25–30 years after which time they can be returned to conventional agricultural enterprises. This is done by spraying the field using a herbicide in early summer. When the shoots have stopped growing they can then be ploughed up.

**Legal requirements**

Familiarity with current health and safety regulations is desirable. Where harvested fuel is stored on the farm advice on fire precautions can be obtained from Fire Authority personnel.

**Financial considerations**

Establishment costs include fencing, pre-planting weed control, ploughing, cultivations, planting, herbicide application, cutting back and filling in. The estimated cost of this per hectare is around £1,850.

Management of the plantation incurs costs such as vegetation control and fertilisation, estimated at around £50 per hectare per year. Cost of harvesting, chipping and transport is estimated at £16 per tonne. This will depend on the scale of the plantation and the methods used.

The market price for chips is highly variable, and has been quoted as anything from £13 to £40 per tonne of chips. At a yield of 30 tonnes per hectare this would generate £390 to £1,200 per hectare at each harvest.

Grants are available for individuals planting willows for coppicing under the Woodlands Grants Scheme. Where eligible, guaranteed set-aside payments are available on land planted to short rotation coppice. If the grower does not receive any set-aside payments growing of willow coppice would not be profitable.

**Further contacts**

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