

Alternative crop factsheet: Short rotation forestry

OPPORTUNITIES FOR SHORT ROTATION FORESTRY

Short Rotation Forestry (SRF) is a system of forestry management where fast-growing timber is grown in shorter rotations, managed by coppicing and allowing regrowth as opposed to waiting until species maturity for harvest as per conventional forestry.

Certain species are more suited to this system, such as Alder, Notofagus, Poplar, Eucalyptus and Sycamore. Willow is successful further south in England, but is not suitable for Scotland due to limited markets for the woodchip biomass product, high costs of establishment, lack of planting grants and poorer growth rates making it uneconomic.

Other species, however, such as those listed above, and certain species of Eucalyptus recently identified through trials, show more potential for the South of Scotland, being more suited to the climate and with favourable growth rates.

The main market for SRF is commercial-scale biomass plants, such as combined heat and power plants, with demand high for both chip and logs. Biomass is well-placed to help the UK meet its renewable energy targets, currently providing 5.3% of Britain's electricity, and estimated with the potential to provide 15% of the country's energy by 2050. A growing number of biomass plants and support from government indicates strong growth for biomass potential in Scotland.

While certain species may not be eligible for planting grants, making establishment of a new area of forestry financially unviable, there may be more scope to introduce SRF at replanting stage following felling of a forested area, as replanting in this case is not eligible for grant funding anyway, but financed from the proceeds of the felled timber.

PROCESSING AND STORAGE

- Chipping-logs are transported to location where the chips will be stored. Logs are stacked, a chipper converts the logs into chip and they are stored to dry out naturally or artificially dried by a heated floor. Split-logs are transported to location where they are cut up and split using a firewood processor, into builders cubic metre bags or designed wooden containers, where they are stored under cover to reduce the logs to desired moisture content of below 20%. For whole tree harvesting, once the trees have dried out sufficiently a tractor or chipper will transport to the end user, power plant or pellet mill.

GROSS MARGIN

Eucalyptus - based on Eucalyptus clear felling at 18 years on a replanting site.

Data source: SAC Consulting

	/ha
Yield (t)	468
Price per tonne	£ 45
Output	£ 11,700
<i>Ground prep</i>	£ 96
<i>Tree planting¹</i>	£ 2,250
<i>Maintenance</i>	£ 500
<i>Harvesting²</i>	£ 4,680
Variable costs	£ 7,526
Gross margin	£ 3,570

¹ Tree planting based on 2 m spacing

² The larger the area the lower the harvesting costs per ha.

NB: When comparing SRC with conventional arable crops the issue is complicated by the perennial nature of the SRF crop. The delay before the first harvest has significant cash flow and interest charge implications for a typical arable farm business.

Grants

- Planting grants are available for traditional forestry species, but not for energy crops, therefore eucalyptus species would not be eligible for planting grants.



- A large amount of biomass heating facilities have been installed on farms and estate over the years. Electricity production by biomass is being used at various location across the south of Scotland. Two pellet producers are based in Girvan and Grangemouth.

CROP ESTABLISHMENT AND PRODUCTION

LAND, SOIL AND CLIMATE REQUIREMENTS

Ground that is level helps in harvesting. A range of species are suitable for the South of Scotland, so site climate, soil type and topography should be considered in selecting species.

ESTABLISHMENT

Trees are typically planted density at 2 metre spacing or 2,500nr/ha; this can be increased up to 1.5 metre or 4,500nr/ha but with associated increased costs.

New plantings require protection from deer, stock and rabbits; fencing in the first year should be assessed on what is likely to eat the tree and how long the tree will take to establish.

Ground preparation should consider the drainage, with the creation of raised planting positions with a tractor or excavator if the ground is wet. Planting is either done by hand or with planting machines for higher density areas.

Trees are either bare root or cell grown. Bare root come with no soil; the planting window is from November to May. Cell grown have a small amount of soil around their base and these can be planted from September to May.

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MAINTENANCE

Maintenance will be required where tree growth is restricted by weed growth, this is typically done by spot spraying around the tree and typically once a year. Pest control and replacement of trees that have not survived may also be needed.

The crop requires first thinnings at around 5-7 years, second thinnings at 10-12 years, and the final harvest at around 16 years, dependent on chosen species. While the main financial return comes with the harvest of the mature crop, thinning and coppicing throughout the crop will provide some income through firewood logs and chippings.

The timing of timber harvesting is very flexible, with decisions of when to harvest based on financial benefit, maximum yield, weather and ground conditions.

HARVESTING AND STORAGE

SRF is typically be harvested by a forestry harvesting machine, which removes the branches and cuts to a certain length in one operation. Alternatively, whole tree harvesting with tree shears, typically mounted on an excavator, allows for utilisation of the foliage e.g. for making wood pellets.

Felled trees and logs are typically stacked so accessible to trucks and to allow for the moisture of the logs to reduce before moving to where the material will be processed. This reduces the moisture content ideally below 25% before transport and so fewer lorry loads are required as the weight is reduced before transport.

Machinery for harvesting biomass is standard forestry equipment and so is easily accessible. Storage is straight forward on concrete floors, which can be heated by biomass and RHI.

Further information

- John Nix Pocketbook, 2019
- SAC's Farm Management Handbook – available online.
- Willow short rotation coppice: Is it commercially viable? A factsheet produced by SAC's Rural Policy Centre in 2008. Available online.

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