

Firewood Production by *Will Wilkinson*

Virtually all of the region's broadleaved woodlands contain material with the potential to be turned into firewood. Indeed, even if you harvest your woodland to produce quality furniture-grade sawlogs, there will always be a percentage of firewood-grade produce that is created in the process. With traditional markets for wood decreasing, there is a growing need to fully exploit the potential of firewood, a genuinely sustainable, local fuel.

Volume

Before considering the firewood route further it is important to fully assess your woodland's accessibility, its tree volume and the stocking density of the firewood it contains. If these three factors run against you it can easily make the costs of producing the wood more than can be recouped in the sale of the finished product.

To run a successful firewood business you will need to convert, split and deliver a considerable annual volume of logs, possibly more than your woodland will produce. If you have only a small area of woodland you may therefore need to buy in raw material to meet the demands of regular customers.

Harvesting

The main ways by which firewood is obtained from woodland are:

- As a by-product in the process of felling a parcel of quality hardwood sawlogs
- As a firewood-grade thinning where the vast majority of the trees felled are suitable only for firewood.



A 20 tonne force horizontal log splitter.

The main ways in which the firewood produce is harvested are:

Felling and stacking to roadside.

Here the felled trees are pulled to roadside by tractor and winch where they are cut to length.

Advantages: The only feasible method on sloping sites.
 Lower capital outlay for machinery.

Disadvantages: Low productivity, especially if the trees are small.

Shortwood harvesting.

The tree/branches are cut to convenient length (say 2m) in the wood and collected up by tractor and self-loading trailer (forwarder).

Advantages: More productive.

Disadvantages: Higher cost of machinery.
Can only be worked on reasonably level ground.

Logging in-situ.

In this situation, the trees are felled, logged, split and loaded into pickups ready for delivery to customer.

Advantages: Low capital costs.
 Efficient.

Disadvantages: The firewood is wet when it reaches the customer.
Can only be worked on level sites accessible to 4WD.

Firewood species

A forester or countryside worker with a woodburner will usually burn most species of wood. However, the average firewood customer will generally prefer ash, beech or sycamore and some oak. This is unfortunate as, if a woodburning stove or range cooker is used, there is no reason why all species, if properly dried, cannot be used.

Many of our woodlands contain these 'difficult' species.



Recently thinned woodland, a few logs for fencing, the majority of the produce was firewood grade.

Wood dryness

The continental approach of felling, splitting into three-foot billets and stacking to dry for 18 months or more before selling, is the best way to create 'hard' dry firewood. In this country the usual approach is to log and split roundwood immediately after felling or after being held in a cordwood stack for some months. With the former, if the split logs are then air dried under cover for 18 months or so, they will make good firewood. With the latter further drying after logging up will also be required to produce good firewood. The longer the wood remains in the round after felling, the higher the chance of decay setting in. Storing wood unsplit in the round for significant periods of time will end in decay for all but the most durable species such as oak and sweet chestnut.

The key to preventing both decay and speeding up the drying process lies in the splitting. As a guide, three-foot long hardwood billets felled in the summer, stacked and covered, take

about 18 months to reach a moisture content of 18% - the ideal moisture content for many stoves.

Logging up

There are three main systems of logging up:

1. Chainsaw logging and splitting by hand or splitting machine.

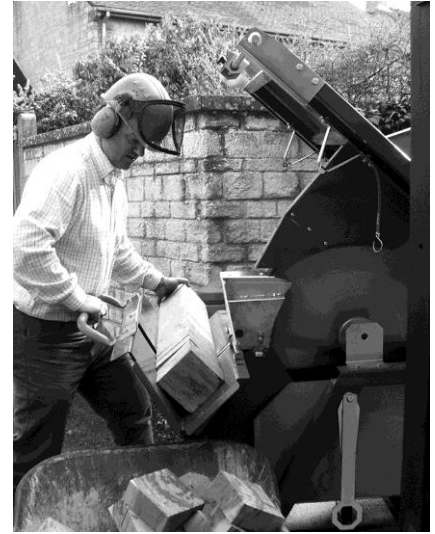
Whilst this requires low capital outlay productivity is also low.

2. Splitting into billets, air drying and logging by circular saw.

This involves a moderate capital outlay but increases productivity and produces excellent firewood.

3. Logging and splitting by firewood processor.

This involves higher capital outlay but also offers the highest productivity.



Logging up using a petrol driven circular saw.

The Load

The huge differentiation in the way logs are delivered means they can also vary widely in volume. Pickups carrying logs commonly vary from 0.45 m³ to 0.85 m³, while builders' dumpy bags usually contain about 0.35 m³ of logs. In order to establish the volume of logs you are delivering, measure the three dimensions (length x width x height) and multiply them together to give the total volume. If you throw the logs in, the wood volume of the load will be about 47% of the vessel volume, i.e. (l x w x h x 0.47). If you stack your logs for delivery, the solid stack volume you will be delivering will be around 67% of the vessel volume, i.e. (l x w x h x 0.67).

Where does a tonne fit into all this? Not easily is the answer! Coupled with the load volume variability, the density of wood varies from species to species, as does the moisture content.

Because of all these variables, it is best to stick to cubic metres (volume) and avoid weight.

Wood Density

Once the wood is dry, the density of the species is the main factor in influencing what quantity of heat your load will provide. Softwoods are generally, though not always, less dense. Poplar is one of the least dense woods, so the quantity of heat will be less than for a similar volume of oak or beech, both of which are dense woods. The softwoods, some of which have reasonable density, also quickly burn hot. This can be very useful for rapid warming or when cooking on range cookers.

Cost case study

It is not easy to demonstrate the costs of felling and extraction in firewood production as there are many operational variables. These include the topography, ease of extraction, size of trees and number of trees per hectare.

As a guide, in 2007, harvesting and extraction costs were, on a good site, as low as £20 per m³. However, these can range up to £45 per m³ and beyond for the more difficult sites. Once logged and delivered, a typical sales value of between £11

The customer is king!

If you supply dry firewood you will be guaranteed repeat orders. All too often one hears a log buyer complain 'the load was expensive and the wood was wet'. This approach to log sales is unfortunate and does not help attract converts to burning logs.

Burning good dry logs on a modern wood burning stove, with over 90% efficiency, is the most effective way of reducing the fossil fuel bill in a modern draught free home. Traditional log production can bring benefit and income to our small woodlands. If firewood production is to succeed, the dry quality of the logs delivered is all important.