A Social Hedge

A project to examine the social, economic and environmental benefits of abstracting, processing and using small diameter hedge wood as firewood, with particular regard to those in fuel poverty.

Ross Dickinson, Thane Farm, July 2022

The purpose of this project was to investigate whether, using the free labour of volunteers, it is viable to abstract small diameter hedge wood that would otherwise go to waste and to sell it at the cost of production (including necessary paid labour and machinery costs) to people in fuel poverty, thereby substantially reducing their annual fuel bills.

Introduction

In the UK there are already many thousands of miles of over mature hedgerows. With the coming payments under the Sustainable Farming Incentive (SFI) it is likely that many more thousands of miles of hedgerows will be allowed to grow in various forms. They may be left entirely, sided or flailed less frequently. In some 15/20 years they will need restorative work to maintain their hedge structure.

There has been a considerable amount of input into the advantages in allowing more hedges to grow, the benefits of which include a better habitat for wildlife, carbon sequestration and to livestock husbandry. There has been less debate how, after 15/20 years, we are going to rejuvenate these hedges. These questions are bound to be of interest to farmers if they are considering letting their hedges grow.

This project examines just one of many different possible solutions, others may include extensive use of tree shears, whole chip systems and the emergence of a new class of rural worker which could be described as "hedge farmers".

Our farm's firewood business, fuel poverty and volunteer labour.

This farm has a small log business with approximately 200 customers. It was noted that during conversations with some of them there was a concern about global warming and the limited ability of the individual to help reduce CO2 emissions. This interaction led onto observations about rural fuel poverty, the pertinence of these discussions has been heightened by events in Ukraine and subsequent significant rises in oil and electricity prices.[1]

A few of these customers expressed a willingness to volunteer their time to helping coppice a hedge once the proposition was put to them[2]. The majority of them could be described as the "fit retired" as well as a few younger people who could come occasionally.[3]

[1] Gas prices have not been considered as the majority of relevant properties are not connected to the gas infrastructure.

[2] The volunteers helped with other lengths of hedges which were not recorded and with some tree planting.

[3] Although there was a great deal of enthusiasm amongst the younger generations they had time constraints with their work commitments.

The volunteers worked behind a practised chain saw worker sorting, hauling, trimming and transporting. The hedge wood was taken back to the farm and processed by paid labour during the next summer.

The project hedge and extracting and processing firewood from it

The hedge selected for this project was 90m long, had a 4m wide hedge bank and the total width was 10m. It is at 600ft above sea level and comprised of approximately 5% ash, 5% holly, 5% rowan, 5% oak, 10% hazel and 70% willow. It had been taken out of an annual flailing regime 12 years ago. Although this hedge had only 12 years' growth[4] it had already reached significant dimensions due to the high percentage of fast-growing willow. It had grown into the fields well beyond the ditches which needed clearing as the drain empts were becoming blocked.

The hedge in question

The hedge was coppiced and woody material down to a 3cm diameter was sorted and taken back to the farm. The chainsaw worker rough cut the hedge growth cutting and dropping any viable material into manageable cord lengths.[5] The volunteers stacked the brash, trimmed the cords with bill hooks and sorted the cords into material which was considered saleable, too small and rods for "cob" making. They also transported this material back to the processing shed.

A small proportion of the largest material was rounded and split while most was processed using a saw bench and separated into saleable logs[6] and smaller logs which are considered unsaleable.[7] This smaller diameter material (3 to 5cm) is described as unsaleable because the public do not want to buy this size of log. Usually we use them ourselves as there are four generations of us on the farm with eight log burners. With the greater output

[4] Often this work only needs to be done at 15/20 years.
[5] About 2m long.
[6] Above 6cm diameter.
[7] The public do not like buying small diameter material.

of these “ugly sticks” created by the volunteer labour we had an excess of this material. The very smallest diameter material such as hazel rods was processed using a branch logger and turned into “cobs” which are used in very small log burners. During the processing all of the material was weighed. It should be noted that the hedge was coppiced in the early winter so the brash still had the leaf cover which meant that this material could not be turned into kindling twigs, had it been done later in the winter it could have also produced several hundred nets of kindling.[8] The nets of kindling are produced from the top branches of the hedge growth using a branch logger to process them into small twigs.

Rough chainsaw cutting for the volunteers to sort

Offering small diameter wood to those in fuel poverty

The farm had some pre-existing heaps of unsaleable hedge wood which is harvested as a matter of course during our hedge coppicing regime.[9] A number of customers were identified as being in fuel poverty[10] and asked if they were interested in smaller material at half price. They filled their own bags and left money in a tin next to the heap. The process worked well at this level with supply and demand being in step. While a more professional approach would be needed in terms of identification of customers and point of sale it did work at this level.[11] It might be that mechanisms already in place for food banks would be applicable.

[8] A hedge can usually produce more kindling material than is saleable.

[9] See Ross Dickinson “A Coppiced Hedge” 2018.

[10] Amongst our customers it was low, four out of two hundred. However, they tended to be heavy users and did consume the available “ugly sticks”. The assumption is that while the percentage of people in fuel poverty who use wood for heating is low the demand from them for a cheaper wood source will meet any increased availability of “ugly sticks”.

[11] The description of people as being in fuel poverty needs to be handled sensitively and some of this was done on a barter basis, for example, logs for eggs.

The firewood produced by the hedge, its value and cost of production
The approximate quantities produced from this hedge were as below:

Saleable material	5 Tonnes[12]
Smaller unsaleable material	4.5 Tonnes[13]
Cobs	0.5 Tonnes.[14]

The wood fuel produced from this 90m of 12-year old hedge

The man hours involved were as below:

Chain saw worker (paid)	18 hours
Volunteers	53 hours
Processing time (paid)	19 hours
Clearing brash (paid) [15]	5 hours.

Financial value of this material:

Saleable material	£1000[16]
Smaller material	£ 450
Cobs	£ 110
Total Value	**£1,560**

[12] Above 5cm
[13] From 3cm to 5 cm
[14] From 1cm to 3cm.
[15] This was done using a material handler.
[16] Cost of split logs next winter circa £200 Tonne

Cost of production:

Chain saw worker	£270[17]
Volunteers	£ 0
Brash clearance	£100
Processing	£475[18]
Storage and delivery.	£400
Total Cost	**£1,245**

It will be noted that this was essentially a break-even activity. However, in the financial sense, there has been some £380 of saved flailing costs[19] and no account is taken of the support payments under the SFI. If, however, the volunteers time was costed it would result in a small loss or break even at best.

The emphasis of this project was to look at the social benefits of this type of activity so no further examination of the financial aspects of this coppicing will be considered here.[20]

Is there a benefit to those in fuel poverty?

The question is how much does buying this material at half price (£100 tonne) financially help people in fuel poverty?

Cost per Kg 10p

1 Kg of wood at 20% moisture will produce 4.1 KWh of heat energy.[21]

1 Kg of oil will produce 12.22 KWh of heat energy[22]

So approximately 3Kg of dry wood will give the same heat output as 1 Kg (1.12 litres) of oil.

At £100 a tonne the cost for this material to the customer is approximately 30p per 12.22 KWh or 2.45p per KWh, compared to 90p per 12.22 KWh or 7.36p per KWh for oil, expressed more succinctly this material is approximately one third the price of oil.

On an assumed annual consumption of 1,000 litres of heating oil, an individual could save £600 by buying the half price hedge material. To replace this theoretical 1,000 litres of oil with saleable logs at £200 per tonne would require 2.6 tonnes so by using this material the customer would save some £260 a year when compared to traditional logs.

Using this method of coppicing this 90m metres of hedge produced (after twelve years growth) 10 tonnes of hedge wood which is the heat equivalent of some 3,000 litres of heating oil. Due to the significant amount of labour needed to turn this hedge growth into wood fuel it would have been unviable (at this stage of its growth) without the contribution of free labour provided by the volunteers.

[17] At £15 per hour

[18] Based on £25 per hour

[19] Based on flailing costs of 35p per meter over 90 metres for twelve years. Given current contractor costs this estimate will be too low for next winter.

[20] The profitability of this type of coppicing is dependent on a number of factors including the age of the hedge, species content, accessibility and distance to processing site.

[21] Assumes a relatively efficient log burner.

[22] Based on 1 litre of oil giving 11.63 KWh of heat energy.

Conclusions

This project shows that with volunteer help small diameter wood can be cropped from hedges and realistically sold at a third of price of oil for the equivalent amount of heat energy and save those in fuel poverty hundreds of pounds on their annual fuel bills, whether they normally buy their heating energy as oil or as logs at standard rates.

The emphasis in this project has been the potential benefit of using volunteer labour but the various permutations of how much volunteer labour is used compared to access to cheap fuel for people in fuel poverty through working on hedges themselves are numerous. On balance, in the majority of cases it is assumed that, given issues such as the cost of transport, child care and other time and cost constraints, the main effort will be from the volunteers.

While the primary question addressed in this project was about creating a cheaper form of heating for people in fuel poverty this type of hedge management does have other significant benefits. Depending on how a project is structured it does offer the opportunity for people to access cheap fuel through providing some labour. It offers one solution to hedgerow rejuvenation, it might form part of the answer to farmers' concerns over allowing hedges to grow, produces cheap renewable energy which is consumed locally while reducing the amount of hedge wood which is wasted when the brash is burnt or stacked. It also hopefully provides the volunteers with a half day out in the countryside allowing for interaction and exercise while knowing they are making a personnel contribution to the social and environmental benefits described above.

Wood fuel from hedges is a by-product of hedgerow restoration but nonetheless this source of biomass heat could be significant in many rural areas even if it is only a tiny proportion of the UK's energy mix. The more practical benefits that hedgerows can provide the more chance there is in maintaining our hedged landscapes.

Some of the volunteers

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