



ECONOMIC SURVEYS OF FARM WOODLAND ESTABLISHMENT, by Chris Britt¹, Martin Buckland¹, Martin Ryan¹, Adrian Whiteman² and Andrew Wilson²

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Summary

There is a large amount of information available to farmers or their advisers on grant payments, revenues from the sale of timber and on loss of agricultural income. However, recent information on farm woodland establishment costs is harder to find. This Note summarises the results of research on the costs of farm woodland establishment in England and Wales in 1993/94. The research was sponsored by the Ministry of Agriculture, Fisheries and Food and by the Forestry Commission. The research was carried out jointly by ADAS and the FC.

Introduction

1. A review of existing advisory literature available to farmers was undertaken. Several of the publications provided extremely useful and quite detailed information on the practicalities of farm woodland establishment. However, most of the information on costs was out of date. Additionally, much of the detailed information was not presented in a way that was clearly understandable by farmers, and the publications often concentrated on traditional forestry options.
2. The research consisted of a site survey of farm woodlands established in 1993/94, a telephone survey of grant-aided planting around that period and price surveys of trees and treeshelters. The results from the survey indicate the typical proportions of total costs that fall to different elements of establishment, and the areas in which farmers can benefit most from time spent shopping around.

Site survey

3. A sample of 23 sites was selected to represent a good cross-section of new farm woodlands in England and Wales. The sample was split almost evenly between ex-arable and ex-grassland sites. A range of soil types was covered, although clay soils predominated. The average woodland size was 3 ha, with a range of planted areas from 0.8 to 11.6 ha. The average area planted per farm was 5.2 ha. All sites but one were on lowland farms (<300 m). Most of the planting was of broadleaved species (92%).
4. Most farmers participating in the survey had no previous experience of planting trees. The average cost of establishing one hectare of farm woodland varied according to the total area planted on the farm, with large woodlands (>10 ha) costing significantly less per hectare than small woodlands. The average cost for planting areas of less than 3 ha was £1626/ha and the average for 3.0-10.0 ha was £1464/ha (for details see Table 1).
5. Plant and plant protection costs were heavily dependent on spacing, and to some extent on the quantity ordered. Typically, however, the cost of the tree material represented around 15-20% of the total establishment cost (£270-275/ha – all sites); while tree protection was responsible for 35-40% of the total (£580-600/ha on sites of less than 10 ha). Where plastic treeshelters were used to protect individual trees, their cost usually represented the greatest single expenditure. Protection costs per hectare can be much lower on large sites, where fencing is often used instead of individual shelters.
6. The presence of deer (perceived as a probable pest problem by 39% of farmers in this survey) greatly increases protection costs – requiring taller shelters or deer-fencing. Individual tree shelters, with stakes, cost from 48-53p for a 60 cm shelter (suitable for rabbit protection), to 83-96p for a 120 cm shelter (suitable for protection from muntjac and roe deer).

Table 1. Average farm woodland planting costs (£/ha) – (sample of 23 sites)

Area planted (ha)	<3.0	3.0-10.0	>10.0	All sites
Plants	250	276	262	267
Protection	585	595	244	432
Fertiliser	5	–	–	–
Weed control	41	26	9	21
Miscellaneous	14	–	1	2
Labour	430	420	135	281
Machinery	3	–	47	21
Sub total	1328	1317	698	1024
<i>Management costs</i>				
Consultancy	269	133	73	127
Own time	29	14	3	11
Sub total	298	147	76	138
Total costs	1626	1464	774	1162

7. The other two major cost components were labour and consultancy costs. Estimated labour costs on sites of less than 10 ha represented, on average, around 25-30% of the total. Most planting was performed and maintenance undertaken by forestry contractors, who were generally reluctant to divulge any detailed information on hourly rates, etc. The cost of planting varied from 7.5p to 20p per tree. The cost of treeshelter erection varied between 15p and 30p per tube. However, one site made substantial savings where trees were machine-planted and protected with quills for only 8.7p per tree. Limited information from consultants on tenders by contractors showed some evidence of large differences between the price of the most and least competitive tenders. All sites employed professional consultants. Fees accounted for an average 9% of the total cost on all sites larger than 3 ha, rising to 17% on sites of less than 3 ha.
8. The cost of fertilisers (only used by one farmer) and herbicides (used by 95% of farmers) was negligible, representing approximately 0.3% and 2% of total cost per hectare respectively.
9. As the site survey only covered the initial planting phase on new farm woodland sites, no information on the costs of subsequent 'beating up' (replacement of dead trees) or later maintenance was collected.

Telephone survey

10. A telephone survey of a random sample of 77 Woodland Grant Scheme applicants in England who had also entered the Farm Woodland Premium Scheme was carried out, primarily to check how representative the farms in the site survey were of all farm woodland sites. The data collected, however, give a useful insight into many technical aspects of farm woodland management.
11. *Survey participants and woodland sites:* 82% of participants were owner-occupiers, and 69% of farms in the survey were less than 200 ha. The main farm activities were arable (32%), lowland livestock (23%) or mixed (23%). Trees were planted almost equally on former arable (51%) and grassland sites (42%). The great majority of sites were on lowland farms (83%). Heavy or clay soils predominated (42%).

Table 2. Average quoted price of trees (pence)
(for 1000+ plants where quoted, otherwise 500+)

<i>Species</i>	<i>Plant type/size</i>	<i>Number of prices*</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Range</i>	<i>Inter-quartile range</i>	<i>Mean</i>
Oak	1+0						
	15-30 cm	8(9)	8.0	16.0	8.0	4.5	11.7
	1+1						
	30-45 cm	6(8)	14.0	24.0	10.0	2.0	20.3
	40-60 cm	9(14)	22.0	38.0	16.0	3.5	28.0
	45-60 cm	7(12)	20.0	32.0	12.0	3.0	27.3
	Cell-grown						
	20-40 cm	4	27.0	28.0	1.0	1.0	27.5
	40-60 cm	4	29.0	33.0	4.0	1.0	30.8
Beech	1+1						
	20-40 cm	6(8)	15.0	32.0	17.0	10.0	22.8
	40-60 cm	9(11)	25.0	45.0	20.0	6.0	32.7
	Cell-grown						
	20-40 cm	4	26.0	27.0	1.0	1.0	26.5
Ash	1+0						
	15-30	6(7)	6.0	12.0	6.0	1.5	9.0
	30-50 cm	5(6)	9.0	15.0	6.0	3.0	12.0
	1+1						
	20-40 cm	6(7)	16.0	25.0	9.0	8.0	20.3
	30-45 cm	7(8)	12.0	24.0	12.0	3.0	19.0
	40-60 cm	14(18)	17.0	41.0	24.0	3.0	25.4
	45-60 cm	10(15)	22.0	35.0	13.0	2.0	26.4
	Cell-grown						
		20-40 cm	4	26.0	27.0	1.0	0.0
	40-60 cm	4	28.0	29.0	1.0	0.0	28.8
Wild cherry	1+0						
	30-45 cm	5(6)	10.0	18.0	8.0	4.0	14.3
	40-60 cm	10	11.0	25.0	14.0	5.0	16.9
	1+1						
	30-45 cm	6(7)	12.0	25.0	13.0	0.0	22.6
	45-60 cm	7(10)	14.0	28.0	14.0	1.0	24.4
	Cell-grown						
	20-40 cm	4	26.0	28.0	2.0	0.0	27.0
Corsican pine	1u1						
	10-20 cm	3	9.0	15.0	6.0	-	11.8
	1+1						
	10-20 cm	3	8.0	11.0	3.0	-	9.5
	15-30 cm	3	11.0	19.0	8.0	-	15.3
	2+1						
	10-20 cm	4	8.0	10.0	2.0	0.0	8.8
Cell-grown							
	10-20 cm	3(4)	15.0	27.0	12.0	-	21.9
Hybrid larch	1+1						
	15-30 cm	3	12.0	20.0	8.0	-	16.7
	20-40 cm	5	14.0	20.0	6.0	5.0	17.1
	30-45 cm	4	11.0	19.0	8.0	0.0	14.5
	30-50 cm	3	16.0	23.0	7.0	-	20.3
	45-60 cm	3	13.0	22.0	9.0	-	18.7

* Numbers in parentheses show the number of nurseries selling that plant type/size where this is greater than the number of prices used to compile figures.

12. *Site preparation*: Almost half of the sites received no ground preparation.
13. *Planting*: 41% of sites planted a mixture of conifers and broadleaves, while 59% of woodlands established were exclusively broadleaved. No site was planted entirely with conifers. Planting was carried out in most cases by contractors (53%), and by hand (91%). Mainly small bare-root plants were used. Only 14% of sites used cell-grown stock exclusively. The most popular tree spacings were 3 m x 3 m (49%) for broadleaves and 2 m x 2 m (38%) or 3 m x 3 m (31%) for conifers.
14. *Tree protection*: Rabbits and hares were perceived as the animals most likely to cause problems. 66% of sites used plastic treeshelters for protection from mammal damage and 20% used 'tree guards' or spirals. Around 80% of sites had fences of some kind.
15. *Sources of forestry information*: Most farmers received professional advice. The farming press and agricultural shows and seminars were other important sources of farm woodland advice for farmers.

Tree price survey

16. A survey of 73 forest tree nurseries revealed a great complexity of plant types and size grades that might be suitable for farm woodland planting. The range of prices for a single type/size of tree could be considerable, e.g. from 17p to 41p for 40-60 cm, 1+1, bare-root ash (mean 25.4p).
17. Cell-grown trees are available from a relatively small number of nurseries. Cell-grown trees were anything from 10 to 120% more expensive than similarly sized bare-root seedlings or transplants. Plants raised in Rigipots were the most widely available type of cell-grown tree, but Roottrainers were also available from several sources. The average prices of the most widely available plant type/size grades for the six species studied are given in Table 2.
18. Substantial cost savings can be made by using smaller plants, or by 'shopping around' to find a cheaper nursery (e.g. a purchase of 20-40 cm, 1+1 beech transplants, instead of 40 - 60 cm, 1+1 transplants, would save an average £248/ha, if trees are planted at 2500 trees/ha); but cost savings should not be at the expense of plant quality.

Treeshelter price survey

19. Treeshelters represent a major part of the total cost of new woodland establishment. The cost of an individual treeshelter varies considerably, largely according to its height. Because large shelters are relatively expensive (e.g. 40p for a 60 cm shelter and 64p for a 1.2 m shelter of the same make – excluding the cost of stakes), the shortest shelter that will protect against all probable pest species should be purchased.
20. The scope for reducing costs by 'shopping around' for treeshelters is much less than for trees. The variation in price is largely because of specification, with very little scope for genuine savings. Prices for 0.6 m shelters ranged from 22p to 40p, and for 1.2 m shelters from 44p to 64p.

The full report of the research is available for a photocopy fee of £5 from Forestry Policy Division, Forestry Commission, 231 Corstorphine Road, Edinburgh, EH12 7AT.