

POTENTIAL WOOD PRODUCTION FROM IRELAND'S NATIVE WOODLANDS

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KEYWORDS: Commercial potential, native timber production, quality, broadleaf culture

Abstract

This paper lists native timber species with commercial potential. It identifies the type of wood products that may be derived from these species, ranging from small diameter wood to sawlog, and looks at the markets that are available. For the production of commercial timber, quality stems must be produced. The requirements for quality timber production are considered in the context of native woodland management. Market accessibility and prices, as well as related opportunities and constraints are addressed.

Introduction

There is no reason why native woodlands should not produce quality timber. However, the type of woodland created and the management practices adopted will influence the amount of commercial timber that may be produced. Against a background of the creation, regeneration or maintenance of a woodland type indigenous to Ireland, this paper looks at wood products that may be produced.

Species

When we consider timber production in Ireland, we immediately think of Sitka spruce (*Picea sitchensis* (Bong.) Carr), followed by a variety of conifers, mostly exotic, and only then do we consider broadleaves, mainly oak, but also beech and sycamore. So the bulk of timber production in Ireland derives from exotic tree species, and by far the greater volume is softwood.

The Native Woodland Scheme (Anon. 2001) lists seven overstorey and fifteen understorey and minor species. Of these, nine species provide commercial timber. These are outlined in table 1.

Table 1. *Native species that produce commercial timber.*

Overstorey species	Understorey and minor species
Alder (<i>Alnus glutinosa</i>)	Wild cherry (<i>Prunus avium</i>)
Silver birch (<i>Betula pendula</i>)	Yew (<i>Taxus baccata</i>)
Downy birch (<i>Betula pubescens</i>)	
Ash (<i>Fraxinus excelsior</i>)	
Sessile oak (<i>Quercus petraea</i>)	
Pedunculate oak (<i>Quercus robur</i>)	
Scots pine (<i>Pinus sylvestris</i>)	

A brief description of the salient features and considerations in growing these trees for timber production follows. The list is in order of commercial importance, listing the broadleaves first.

Oak

Timber

The timber of the two species, pedunculate (*Quercus robur*) and sessile oak (*Q. petraea*) is similar and interchangeable. It is the most readily available hardwood timber in the country, but the quality on offer is very variable, and only a small amount is top quality.

The sapwood is creamy white and the heartwood ranges from yellowish brown to dark brown. Irish oak is often darker in colour than continental European oak. Growth rings and pores are distinct, giving a marked grain structure to the wood. Quarter sawn wood shows attractive silver grain. A medium density wood (720 kg/m³), it is tough and durable.

Uses

Low grade: fencing, firewood
Middle grade: cladding, construction, exterior trim, flooring, rustic furniture, beams
Top grade: joinery, cabinetry, flooring, panelling, veneers.
Quality butts: high class and figured veneers.

Market requirements

Light colour; straight cylindrical stem; uniform growth; blemish-free stems.

Management for quality

Early shaping is recommended, but may not always improve form; thinning needs to be conservative to prevent growth of epicormic shoots, otherwise these must be removed annually; aim for large (70cm d.b.h.) clear stems for veneer logs to maximise value with a rotation of 120+ years for pedunculate oak and 150+ years for sessile oak.

Ash

Timber

White to light brown with little or no distinction between sap- and heartwood; growth rings and pores are distinct giving pronounced grain; may have irregular dark brown to blackish heartwood which is structurally sound and can provide an attractive feature known as olive ash. A medium density wood (700-800kg/m³), it is non-durable.

Uses

Low grade: firewood
Middle grade: flooring, tool handles (short clear lengths can be recovered from somewhat knotty timber)
Top grade: furniture, cabinetry, flooring, plywood, veneers
Quality butts: hurleys (preferably before the tree is 40 years old)

Market requirements

Unless otherwise sought, light, even colour; straight cylindrical stem; uniform growth with large annual rings (4 - 5mm) for strength.

Management for quality

As ash has good apical dominance, formative shaping may not be required, but where frost damage to the leader occurs it is recommended. Ash is one of the best trees for natural pruning and a stocking rate of 3,300 stems/ha should obviate the need for pruning, but in a native woodland regime pruning may well be required. Ash needs to be grown vigorously and appropriate thinning is essential. Although it is very site specific, ash is capable of producing large volumes of high quality timber over a short rotation on suitable sites. For this reason it is potentially one of our most valuable species and with hurley butts in short supply, prices of 400 per m³ are attainable.

Wild cherry

Timber

Not frequently found in Irish woods, this attractive tree can supply valuable timber. Wild cherry is a fine-grained timber, with distinct growth rings. Sapwood is a yellowish red colour; the heartwood, when fresh, is only slightly darker but darkens to light golden-reddish brown. It is a highly decorative and valued timber. It is of medium density (600/kg/m³).

Uses

Low grade: firewood and woodturning
Middle grade: furniture and cabinetry
Top grade: high-class joinery, furniture and cabinetry, panelling and veneers.

Market requirements

Top grade logs must be completely blemish free with good colour. Standing trees are hard to assess due to interior damage. Planking logs should have a mid-diameter greater than 35cm and veneer logs over 45cm. In Ireland a 25cm log is considered big. Defects will cause the log to be downgraded from veneer to sawlog quality.

Management for quality

High value cherry can be produced over a 50 - 80 year period. In Germany prices in excess of 500/m³ have been realised. As cherry does not shed its branches pruning is essential, up to 6m on final crop trees. Pruning should be carried out between June and August; do not leave pruning to the winter months.

Birch

Timber

The timber of both species, *Betula pendula* and *Betula pubescens*, is similar but *B. pendula* has better log form. An even textured pale whitish yellow wood with no distinction between sap- and heartwood, birch is generally straight grained, and gives a good finish. Medium density of 600kg/m³. The wood is non-durable.

Uses

Low grade: firewood, pallet wood

Middle grade: furniture carcassing, flooring, rustic furniture, kitchen utensils, industrial grade plywood

Top Grade: furniture, panelling, plywood.

Market requirements

The market for birch in Ireland is not developed. Logs should be straight, defect free as far as possible and sound. Logs greater than 15cm diameter are not readily available.

Managing for quality

Birch is an invasive species and may encroach on other trees. As it is a small tree, reaching maturity at about 60 years, occasional birches in a native woodlot may not be of commercial value. It has good apical dominance, so shaping would rarely be necessary.

Alder

Timber

A light to medium reddish brown wood, somewhat coarse in texture, sapwood being straw coloured. Growth rings are discernible but not very obvious. The density is around 400kg/m³, which makes it a fairly soft wood. The colour of Irish alder is not as good as American - the latter having a richer, redder hue.

Uses

Furniture and doors, if the stock is large enough.

Market requirements

The market for alder is poor in Ireland, but could be developed.

Management for quality

There is little Irish experience growing quality alder. A tree of wet places, it has been planted, and grows naturally, along river banks and lake sides. It attains full development at about 40 years, thus does not grow to become a large tree. Close spacing will help maintain straightness and reduce branching. Early thinning is essential.

Scots pine

Timber

A light strong softwood, the heartwood is a pale reddish brown colour, while the sapwood remains straw coloured. The density of Scots pine is about 510 kg/m³. Known as red deal or European redwood, it is the standard by which other utility softwoods are judged.

Uses

Low grade: rough carcassing, pallet wood, fencing, pulpwood

Higher grades: structural timber, joinery

Market requirements

Small branched or knot-free timber fetches a good price for joinery

Management for quality

The tree is self pruning if kept at reasonably close spacing. It is important that branches do not grow too large as this will seriously downgrade the quality.

Yew

Timber

Ranges in colour from a light toffee tan to rich red. The tree, though generally small, can gain considerable girth and is very long lived. Although it is a softwood, it is harder than many hardwoods, with a density of 670kg/m³.

Uses

Long lengths of yew are rare; most valued for turned craft products and highly prized for veneers, for the manufacture of wall panels, and furniture.

Market requirements

Large sound butt logs are favoured for veneers; smaller material will find local markets for craft work.

Management for quality

Yew is not grown commercially in Ireland, and there are no prescriptions for its management for timber production.

Quality production

Production of timber for the market requires a dedication to maximising quality through the application of good silvicultural practice. As there must be an investment of time, expertise and materials to produce a worthwhile crop of saleable timber, it is important that the process is accomplished in an economic manner. There is a wealth of information available on appropriate management for timber production (e.g. Bulfin 1992, Joyce *et al.*, 1998) so this paper will confine itself to some broad prescriptions.

Selection of species suited to the site is of paramount importance. Poor growth performance will make it impossible to afford the required intensity of crop management. Not all sites are capable of adequately supporting a stand of broadleaves, although birch is a pioneer species that will tolerate poor sites. Where the site is marginal for crop production it may be wiser to exclude it, or relegate it to non productive woodland.

Depending on species, formative shaping may be necessary for good stem development. Whereas oak stems are frequently of poor shape, formative shaping may not yield noticeable improvement. Ash, however, does respond well (Bulfin and Radford, 1998).

Keeping trees close together in the early stages of development will help to reduce side branching, and will likely improve the overall straightness of stem. Where natural shedding or suppression of side branches does not occur, pruning of selected final crop trees will be necessary. It is important to prune before heartwood develops in the branches, to avoid disfiguring knots and pruning wounds that may allow decay to enter the tree. Timber buyers do not want knotty timber, so every attempt must be made to reduce branching in the lower stem to a minimum.

Thin regularly, and according to prescription, to maintain vigour in the crop. Constant growth rate is important to minimise drying and working defects in the converted timber. Some species, if unduly crowded as the canopy closes, may stagnate and prove difficult to reinvigorate again when thinned. Over thinning in oak must be avoided, as an increase of light to the stem will encourage the development of epicormic branches, thus reducing the timber quality.

An important aspect of management is access to the wood for felling and maintenance. In a native woodland environment the type of access required for mechanised harvesters will hardly be necessary, but for economic extraction of saleable timber there must be reasonable access for a chainsaw crew and hauling unit. If access is problematical, it will be accounted for in the price offered for the timber. The alternative is to organise felling and extraction and offer the timber for sale felled and at roadside. Even in that situation, ease of access will reduce costs. The quality of the felling crew has a serious impact on the value of the timber offered for sale. The amount of hardwood timber sold annually is such a small fraction of total timber sales (softwoods and hardwoods) that there is great difficulty in getting competent felling crews. There is not enough work in any one locality for hardwood felling crews, so they either have to travel extensively or engage in other operations. The net result is that there is a significant lack of skill in felling hardwoods. Unlike the uniform nature of softwood logs, hardwoods are much more varied and require knowledge of the market, saleable lengths and quality logs to ensure that the timber is presented to the buyer in the best possible assortments. Incorrect bucking, or cross-cutting can result in a significant loss of value to the purchaser. Frequently the best option is to present the full tree length for the buyer to assess, who can then indicate how he wants the logs presented. It is well worthwhile to become familiar with log quality so that one can ensure a fair price. Table 2 below shows the range of prices that one may expect to receive for hardwood logs at roadside.

Table 2. Indicative prices for commercial logs at roadside

Species	Grade	Price (€/m ³)
Oak	A 40cm + diameter	130 - 170
	B	110
	C	50 - 85
	thinnings	35 - 55
Ash	Hurley butts	up to 400
	A	60 - 90
Cherry	Good straight logs	130
Birch	A	65 - 80
	B	30-4

(Heaney & Doyle, 2004)

Market

The market chain is producer to feller, sawmill, manufacturer and end user. Because Ireland's hardwood resource is small, we have imported hardwoods in quantity, for a long time; much of it tropical. Manufacturers have traditionally expected high quality - originally clears or firsts, but currently FAS (firsts and seconds) - and are reluctant to settle for less. Such high quality can only be guaranteed when there is an abundance of supply, which is not the case in Ireland. Seconds and thirds can be quite successfully processed and, it appears, end users do not have the same difficulty accepting such grades. Whereas the softwood market has come to terms with Irish timber and there is a steady demand for it, the same is not true in the hardwood market. Limited supplies, uncertain quality and lack of information on supplies into the future all mitigate against the development of a satisfactory market for the home-grown product. There are some 25 hardwood sawmills in Ireland, of which four to five have kiln drying facilities. The conversion and drying of hardwoods is considerably more complex than softwoods. Whereas structural softwoods can be dried in a matter of days, hardwoods may take up to seven or eight weeks to be successfully dried, depending on species and dimensions. The technology exists to properly process home-grown hardwoods, but work needs to be done to improve its market prospects.

Steps that can be taken to improve the market for hardwoods are as follows:

- The Forecast of Roundwood Production (Gallagher & O'Carroll, 2001), published by COFORD, gives figures for potential hardwood production up to 2015, but the breakdown by species is lacking and the databases from which the forecast was derived need to be updated. The figures presented show that no increase in hardwood production can be expected before 2015 at least. A comprehensive survey of the hardwood resource has been initiated, and needs to be concluded without delay.
- Felling and extraction of timber from small woodlots is expensive. The conservative management of native woodlands means that lower volumes are likely, thereby increasing the unit cost in felling and extraction. Management of the forest should take this into account and ease access to the timber. The proposed felling regime should take account of the need for unhindered movement of machinery. The arrangement of coupes could reflect this.
- As the amount of timber to be harvested from native woodlots is likely to be small, it is imperative that the maximum added value accrues to the trees that will form the commercial crop. Intensive management is not only possible in smaller woodlots, where it would be quite impractical in large plantations, but it must become an accepted practice in hardwood stands, as neglect can ruin a potentially valuable crop. Individual hardwood trees of superior form can be worth a lot of money.
- Shaping and spacing are the most important elements in the production of straight and branch-free logs. Many hardwoods benefit from close initial spacing to draw the stems up. Judicious thinning will then release stems that are tall, straight and branch-free, to encourage increment on valuable trees.

Opportunities

- One of the main opportunities is the demand for quality Irish hardwoods. There are buyers on the continent who are asking for Irish timber, but can rarely get it. Industry growth in the last 10 years has been significant, with improved technology among processors and greater awareness among producers of the value of their timber.
- World markets are changing - continental processors are happy with lower grades and hardwood laminates are becoming acceptable, particularly since the introduction of laminated hevea wood (rubberwood) products from east Asia. This means that there should be a greater prospect to produce marketable goods from smaller trees.
- The enormous inroads that have been made into the once vast resource of tropical timber have had a twofold effect. There is a dwindling supply of this material and a growing demand that residual stocks be conserved. The result is a reducing market for tropical timber, certainly in its unprocessed form, and a growing demand for temperate hardwoods produced from sustainably managed forests. Native woodlands are to the forefront in sustainable management, and any produce from such forests has to be well received.

Constraints

- The major constraint is the small volume of Irish hardwoods currently being produced, and likely to be produced over the next 10 to 20 years. From this arise other constraints listed below.
- There are few competent logging crews to ensure that hardwood trees are felled correctly to maximise their yield.
- There is no developed firewood industry to make viable the harvesting of limbs and defective stems, which would do much to improve the financial reward from harvesting hardwoods.
- The limited resource and the complexity of gathering good statistics on the nature and amount of the hardwood resource does not help in planning the development of the industry.
- The conservative nature of the Irish hardwood processing industry further reduces the volume of material that is acceptable to the market.
- Finally, the nature of native woodland development may limit commercial log supply.

Conclusion

Even though the resource is small, there is a need to develop a broadleaf culture through education and promotion. This should entail promoting the use of smaller logs among processors, and advocating that end users specify native timber wherever possible. Maximising the utilisation of hardwoods should encompass biomass and the development of a fuelwood industry (a growing desire to conserve our peatlands may help such development) and a more complete inventory will help the industry develop in a rational way.

A valid aspect of sustainable forest management is that the endeavor should be economically sustainable. In fact, without economic sustainability the maintenance of native woodland to exclude intrusive non-native species could well be jeopardised. There could be several sources of income to sustain the woodland, and one of those is undoubtedly the supply of quality, native hardwoods, which need not compromise the main objective of conservation. There is every need to develop a hardwood resource in Ireland, and suitable management of native woodlands could be a significant contributor to that resource.

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