

Growing Broadleaves for Quality Timber

Species Choice

This Guidance Note is one of a series summarising information presented at a seminar on “Growing Broadleaves for Quality Timber”, held in February 2010 as part of FC Scotland’s Timber Development Programme. These notes provide information on all the main aspects of growing quality broadleaved timber, from choice of planting stock through to timber marketing, together with relevant references and links to more detailed information.

This presentation, which was delivered by Rick Worrell (Forestry Consultant), is available for download through the [seminar web page](#).

Main species

The following main species are considered as appropriate for quality timber for both woodland creation and restocking: ash, oak, sycamore, wild cherry (gean), silver birch and beech. In addition there is a range of minor species including: sweet chestnut, laburnum, Norway maple, walnut, lime, alders and *Nothofagus*. This paper focuses on the 6 main species.

Site condition is only one part of species choice

All the 6 main species can grow adequately on good brown earth sites below about 250 m. The [Ecological Site Classification \(ESC\)](#) and the [Ecological Management Information System \(EMIS\)](#) can give guidance on which species are suitable for specific site types. However the 6 species all perform well on a core of common soils types on the ESC soils grid, meaning that for many better sites, site conditions alone cannot determine which is the most appropriate species. Similar issues occur with conifers on good brown earth sites, where Sitka or Norway spruce, Douglas fir, European larch might all be potentially suitable. This means that other factors need to be drawn into the decision.

Management approaches

Two management approaches can be applied to the growing of quality broadleaves, which have a bearing on species choice:

- Plantation approach – relatively “intensive” approach focused on timber production, where species choice is guided by site attributes *plus* silvicultural characteristics and potential timber markets.

- Ecological approach – where there is more emphasis on ecological outcomes and timber is one of several benefits. Species choice focuses on use of site-native trees and is guided mainly by the composition of the National Vegetation Classification (NVC) woodland type that is most appropriate for the site.

This paper explores the plantation approach.

Factors in species choice

In addition to site type, the follow factors can be identified that influence species choice:

1. Marketability of the timber
2. Ease of establishment of trees
3. Growth rate/rotation length
4. Propensity for good form (especially if neglected)
5. Risks from pests and abiotic factors.

The following sections outline the importance of these factors and Figure 1 gives an overview of the characteristics of the 6 species in terms of these factors.

1. Marketability of the timber

Species where past evidence suggests that owners can feel confident about future marketability of the timber are clearly more desirable. For some species we can have a fair degree of confidence in their marketability; whereas for others markets are less certain. Of particular importance is the market for thinnings, as early revenues make some species more attractive financially (e.g. ash). However, this aspect is becoming less critical as the markets for biomass mean that most types of small dimension timber are becoming easier to sell. Some timbers are relatively versatile i.e. they supply a range of markets (e.g. oak) whereas markets for other species are more restricted (e.g. ash). A major factor in marketability is the likelihood of timber defects on certain sites (e.g. shake and stain).

2. Ease of establishment and early growth

With proper silviculture it is possible to grow any of the main species successfully on suitable sites. However some species are known to be inherently trickier than others to establish. In addition, species with slower early growth spend a longer period prone to damage from deer, voles and take longer to get away from weeds. The more difficult species require a greater investment in early silviculture and this can be a factor in species choice, i.e. there is merit in choosing species that are easier to establish, especially if there are any questions about the levels of management input.

3. Growth rate / rotation

Species that grow faster and reach rotation age earlier are attractive to many growers. Fast growing species have rotation lengths in the range 40-80 years (e.g. sycamore, ash, birch, and cherry); whereas slower growing species have rotations of the order of 100-140 years or more (beech, oak).

4. Propensity for good form

Some species have inherently good apical dominance and monopodial form, whereas others are more prone to forking and heavy branching. If the best seed sources are available this should not be a problem, but currently seed supply from high quality sources can be hard to locate for some species. In this situation species which tend to have inherently good form might be preferred (e.g. sycamore, ash). This factor becomes particularly important if there is a risk that the crop might undergo a period of neglect.

5. Disease and damage

All tree species are susceptible to diseases and damage, but it is still worth considering the risks as part of species choice. Grey squirrels are an increasing threat and can damage all species, but sycamore and beech are most susceptible and ash is least likely to be damaged. Loss of the leading shoot to damage by insects or unseasonable frosts is known to be an issue, but it is not clear whether some species are more prone to this than others.

	Marketability	Establishment	Growth rate	Form	Pests/diseases
Ash	Green	Green	Green	Green	Green
Beech	Yellow	Yellow	Red	Yellow	Yellow
Birch	Red	Yellow	Green	Yellow	Yellow
Cherry	Yellow	Green	Green	Yellow	Yellow
Oak	Green	Yellow	Red	Yellow	Yellow
Sycamore	Green	Green	Green	Green	* Red

* If grey squirrel is present or likely to establish

Figure 1: Overview of suitability of the 6 main broadleaved species – the colour of the cells denoting their relative merits as follows: green = good; yellow = moderate; red = poor.

Mixtures or single species?

A further issue in species choice relates to whether species should be grown pure or as mixtures. Mixtures have the virtue of spreading risk. If it is uncertain which species will perform well on a site, a mixture of candidate species can be planted in the knowledge that at least one is likely to grow well and potentially form a final crop. However mixtures complicate all aspects of management especially thinning and harvesting. It is usually best to opt for single species “blocks” or mixes with a clear dominant species; these changing across the site to reflect site conditions. Mixtures with a large number of species, which have become fashionable in farm woodlands, should be avoided. Mixes of species should be limited to species with similar rates of height growth (e.g. ash, sycamore, birch, and cherry). Mixtures involving conifers can, if managed carefully, induce good form especially in oak. However these are very vulnerable to periods of neglect when the broadleaved species can be lost and should only be considered where consistent high quality management can be assured.