New woodlands in lowland Britain

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Summary

Advances in technology will mean that significant quantities of arable and grass land will become surplus to agricultural requirements in Britain over the next 20 years. This represents a real opportunity for the creation of new woodlands. A programme carried out by the Forestry Authority Research Division to facilitate the creation of new farm and urban woodlands is briefly described, and the main recommendations discussed.

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Introduction

British Forestry Policy, and the silvicultural research which supports the policy, evolved rapidly in the 1980s. This was the result of the development of a new broadleaves policy, and a new emphasis on the non-market and public benefits of trees and woodlands, especially near centres of population. The Community Forest supplement to the Woodland Grant Scheme aims specifically to secure public access. This reflects the current government view that public money should be used to provide public benefits, and that timber production *per se* is not automatically regarded as conferring public benefit. Inevitably attention has

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focused in the lowlands of England where there is the greatest population density, the most fertile land, and a predominantly broadleaved woodland landscape. The following key issues now pre-occupy the research programme:

- Farm Woodlands – the creation of multi-purpose woodlands on land surplus to agricultural requirements.
- Urban and peri-urban initiatives, including "community forests".

In this paper, I shall take a closer look at these land-use changes, and at the silvicultural issues which have been raised as a result.

Agricultural surpluses

Agriculture surpluses are the result of improvements in technology, for example the increase in the average yield of wheat from 2.5 tonnes/ha in 1947, to 6.4 tonnes/ha today (McCleod, pers. comm.), whilst demand is projected to be more or less static (North, 1990). Table 1 shows agricultural land-use in Great Britain projected to 2015 on the basis of the application of existing technology, and predicts 5-7 million hectares of land surplus to requirements, mostly taken from sheep and cereals.

Areas in millions of hectares:

	1985	*2015(1)*	*2015(2)*
All Cereals	4.0	1.5	1.6
Dairy	2.2	0.6	2.4
Beef	1.9	1.4	1.4
Sheep	8.1	6.2	6.2
Other	1.0	0.9	0.9
Total	17.2	10.6	12.5

(1) Efficient; (2) Restricted Nitrogen Input.

Table 1. *Forecast land-use budget for Britain. (after North 1990).*

In contrast, Great Britain is only 10% forested, and only produces 12% of its consumption of wood and wood products, with imports worth £6.3 billion in 1992 (Anon, 1993).

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Farm woodlands

The Farm Woodland Scheme, which offered planting grants and annual payments in compensation for loss of agricultural revenue for woodlands planted (mainly) on arable land, failed to meet its target of 36,000ha of new woodlands over the 3 years that the scheme operated. A final total of 13,908ha was approved and 11,672ha have actually been planted. The planting grants for broadleaves were worth twice as much as those for conifers, and this is reflected in the figures for species planted (10.4 million broadleaves, and 5.7 million conifers to May 1990).

Experiments on arable land

A series of experiments were set up on farms during the 1980s (Williamson, 1992a) to investigate methods for establishing new farm woodlands. At the time, it was felt that arable land might offer fewer problems than upland pasture, while allowing for a greater range of species and silviculture options. As might be expected, arable land proved to have a set of problems of its own:

- Weed growth is luxuriant, and weed control methods developed for upland forestry are inappropriate.
- Much of England's arable land overlies chalk and limestone, and arable agriculture disturbs the soil profile so that the soils may have a pH>7 right to the surface.
- Heavy, fine-textured clays are subject to waterlogging in winter, drought in summer, and deep fissures can appear which expose the roots of planted trees.

The work has led to a set of practical recommendations (Williamson, 1992a). To summarise:

- Cultivation greatly stimulates weed growth and if possible grass swards and arable stubbles should be left undisturbed. However, many of the sites have a plough-pan which must be disrupted by ripping.

- Specific weed control prescriptions are necessary. A range of herbicides known to farmers have been tested on trees, and given off-label approval for use in farm-forestry (Williamson, 1992b).

- At 3 x 3m spacing, mechanical equipment can be used, but large areas between the rows of trees are unproductive during the early years of establishment and a range of vegetation treatments, including wild flower mixtures and kale for game cover, have been tried as alternatives to mowing the vegetation between the weeded rows.

Poplars and energy forests

The new Belgian poplar clones, which offer outstanding growth and disease resistance, are likely to find a place on surplus arable land, and low-lying grass land. They may be managed using a variety of spacings and rotation lengths, depending on the desired end-product:

Initial spacing	*Rotation length*	*End product*
1m x 1m	2-5 years	Energy chips
3m x 3m	8-15 years	Pulp/fibre/ energy chips
8m x 8m	20-25 years	Veneers

The main thrust of the research programme is disease screening and the evaluation of new clones, including yield in relation to site. The programme is part financed by the Energy Technology Support Unit, and part by two small EC contracts.

Woodlands around towns

The three lead Community Forests have now produced their strategic plans, and the scope of these is much wider than a classical forest working plan. There is strong emphasis on recreation, amenity and community relations, and rather less on basic land use facts which might be useful in attaining a significant expansion of forest cover with the designated areas.

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The Forstry Authority Research Division has been active in establishing fairly large (1-20ha) demonstration woodlands, first to demonstrate what can be achieved and how to achieve it, and second to gain experience of the issues involved. To summarise:

- Much urban land is damaged to some degree. In Thames Chase Community Forest, for example, which extends to over 30 square miles, 16% of the area overlies landfill. The specifications for reclamation rarely envisages a woodland after-use, and some of this land is

quite unsuitable for the creation of new woodlands.

- The new woodlands should not be limited by unduly rigid adherence to ideas of 'naturalness'. New woodlands around towns serve a function intermediate between that of a garden, and that of 'wildspace'. Above all they must be attractive.

- Exotic tree species, capable of thriving on difficult and damaged soils, and offering the many benefits that trees can bring to the lived-in environment, will often find a place.

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- Urban planting schemes specified by some landscape architects are excessively expensive and inappropriate for the creation of new woodlands.

- Trees need to be planted at relatively narrow spacing, using inexpensive forestry-type planting stock. Plantings of this nature are more robust than plantings using expensive whips and standards, over-protected with lots of wire and woodwork. They can withstand minor losses, and are less likely to attract vandals.

Spacing

Initial spacing has proved to be an important issue in the creation of both farm and town woodlands. The grant schemes allow maximum payment at

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the minimum stocking of 1,100 stems per hectare. This may be adequate for restocking woodland sites where volunteer woody growth provides a degree of shelter and side-shade, but is unlikely to result in high quality timber production when applied to the afforestation of agricultural land, especially with species with weak apical dominance like oak and beech. Unfortunately, such is the power of financial incentives that planting at this density has been widespread, and indeed our current recommendations for the establishment of farm woodlands assume tractor access. The use of treeshelters to protect against animal damage, and also to allow the use of non-selective herbicides, becomes prohibitively expensive for larger schemes at narrow spacing. On the other hand,

narrower spacings confer the following advantages:

- Earlier suppression of weeds and hence lower maintenance costs.
- Greater tolerance to animal and climatic damage.
- Flexibility to manage the stand to meet variation in site conditions, people pressure, etc.

Recommended stocking densities for the production of high quality broadleaved timber are given in Forestry Commission Handbook 9 (Kerr and Evans, 1993).

Native broadleaves

The British Government's Broadleaves Policy has heightened interest in the management of existing broadleaved woodlands. The creation of new woodlands in the lowlands under the Woodland Grant Scheme and Farm Woodland Scheme has largely employed native broadleaved species. The importance of our small remnants of ancient semi-natural woodlands (less than 1% of woodland cover) has been highlighted by Rackham (1980) and Peterken (1981). For these reasons, a new research effort is being put into the ecology of native broadleaves and the creation of new native woodland.

Conclusions

Land use change in Britain has already begun and is gathering pace. The land which is becoming available for afforestation presents a new challenge which will require the development and communication of a new set of silvicultural recommendations. Foresters will need to understand, as always, the needs of the land owner and the public, and the ecology of the tree species they choose to plant.

There is much scope for the expansion of forestry in the lowlands, and silviculturalists will need to remain close to policy makers, since the structure of grant aid will be the single most important factor in deciding the nature of the new woodlands created.

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