Implications and adaptations: species choice and timber production

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The physical climatic characteristics considered in other papers are expanded here to include features of the economic, social, managerial and institutional climates. Traditional tree introduction and breeding programmes have concentrated on the genetic improvement of traits related to tree survival, growth and some wood properties for current sites and conditions. In the UK the bulk of this work has focussed on conifers, especially exotic species.

The results of much silvicultural and genetic research are obtained effectively one generation too late, when managerial methods or market requirements have changed; the currently predicted changes in the various other climates require predictions of further change in publicly acceptable species, properties and silviculture. Traditional breeding activities must be amended to incorporate the range of newly demanded environmental and social benefits from trees and forests, the debate about the need for and definition of indigenous species, and the recognition of economic potentials of hardwoods for both industrial and private scales of forestry.

Recent technologies of identifying, capturing, incorporating and propagating genetic variation are being incorporated in tree improvement programmes in many countries but need to be considered within the light of public concerns, especially about exotic species, genetic modification and clonal forestry. The role of the researcher and the practitioner is to evaluate genetic variation and maintain it for future flexibility to cope with climatic change.

The classic homoclimal matching of seed source to planting site and the classification of the UK into zones to define permitted transfers of indigenous genetic material have provided a good if somewhat superficial basis for trials of species and provenances, as shown by early results of collaborative trials (e.g. BIHIP breeding seedling orchards and EU ecosystem transplant research coordinated by the OFI). These zones need to be reconsidered in the light of predicted environmental changes and information on the variability and stability of population performance derived from such trials and from molecular studies. Climatic and ecosystem modelling approaches indicate that sources from southwestern and possibly Mediterranean Europe will be more suited to the UK than the currently planted (northern European) or naturally regenerated (local “indigenous”) material, at least for hardwoods. Where coniferous products are required, the well proven knowledge of western American sources may be used to model and predict the optimum provenances for future conditions.