

Workshop Reports

Summarised by I S Cornforth

1. Design objectives and site selection

Chaired by Tat Smith

DESIGN OBJECTIVES

In his opening remarks, Tat Smith proposed the following basic needs when designing long-term forestry trials of the type proposed:

- quantify objectives;
- focus on processes by which trees impact on soils;
- emphasise 'productivity' rather than vague concepts such as sustainability and environmental quality; and
- use designs sufficiently flexible to allow additional aspects to be added at a later stage.

A general hypothesis was proposed that: tree species influence a soil through their effects on soil chemical, physical and biological properties. The resultant objectives should then be sufficiently general to allow specific studies to be superimposed in the future. Examples of such objectives proposed were:

- to determine the effects of plantation forestry on future plant production; and
- to determine the effects of tree species (including their associated understorey species) on soils and long-term site productivity.

These, in turn, would require more mechanistic hypotheses, for example:

- that wide C:N ratios of litter decrease productivity; and
- that changes in productivity are driven by

foliar and root chemistry.

In practical terms, such an approach might suggest the use of very simple reference plots onto which process studies could be imposed subsequently.

SITE SELECTIONS

Influential site characteristics were proposed; they included: climate, geology, physiography, soil series and soil variation, landscape position, initial vegetation, catena position and baseline position. Ideally, a series of trial sites should be used, with selection based on a mixed matrix of properties such as mineralogy, soil moisture, texture, climate and landscape position. This, however, is both logistically and financially impossible for the proposed investigation. A possible compromise aimed at overcoming interaction between sites and species would be to compare a range of species at a single site and then extrapolate results using results obtained from a series of single species plots located on contrasting sites. This approach has been used to investigate the nutrient requirements of a range of vegetable species in the United Kingdom (Greenwood *et al.* 1974).

Reference

- Greenwood, D J, Cleaver, T J and Turner, M K. 1974. Fertilizer requirements of vegetable crops. *Proceedings of the Fertilizer Society* **145**, 5-31.