

Reviews

The potential of Western Hemlock, Western Red Cedar, Grand Fir and Noble Fir in Britain. By J. R. Aldhous and A. S. Low. Forestry Commission Bulletin 49, HMSO. £1.50.

Bulletin 49 reports the findings of a survey carried out in 1967-'68 on the potential of four minor species, western hemlock, western red cedar, grand fir and noble fir as an alternative to the recognised major species in British forestry. Crops surveyed were planted prior to 1950 and chosen to represent the different site types and the different climatic regions of Britain. The findings are presented in seven chapters dealing with the different aspects of an afforestation programme covering both techniques and costs. Comparisons are made with the major species for each aspect the results being summarised in tabular form.

It was found that establishment costs, based on 1968 data, are higher for the minor species due to greater seed cost and poorer survival rate. An added factor was late spring frost which tended to be a limiting factor on those sites where these species might form a possible alternative.

Growth comparisons are presented in chapter 3 in graphical form. Each graph is based on from 2 to 20 comparisons per species. Correlation coefficients are presented for each set of data. On suitable sites grand fir outgrew the major species, western hemlock was as productive while western red cedar and noble fir were generally poorer. First thinnings occurred later even on the most productive sites and the produce was smaller in size than for similarly aged Sitka spruce.

The species represented in the survey are known to be subject to stem defects. The survey of pole stage crops showed that drought cracks were most serious in the *Abies*. These were also present in Sitka stands but were less severe. Fluting was found to be quite prevalent in western hemlock and western red cedar while buttressing was confined to western red cedar. Fomes was considered a serious problem only for western hemlock. Grand fir though it appeared resistant to decay in earlier studies was found to be considerably attacked in subsequent investigations. Other fungal diseases did not present a serious problem. Insect attacks were confined to *Adelges* infestations of grand fir where attack if severe could lead to rotholz (abnormal wood formation similar to compression wood) and possible death of young trees.

Utilisation of the end product is covered under five headings, weight and strength properties, sawing, appearance of wood, pulp-

ing properties and marketing. Of the four species only western hemlock had a higher specific gravity than Sitka, while in all instances their moisture content far exceeded both Sitka and Douglas fir. Both their sawing and wood working properties were considered to be more than adequate. All of the species were considered suitable for pulping with the exception of western red cedar though data for noble fir was based on U.S. experience. Marketability was closely related to pulping suitability.

The penultimate chapter deals with the revenue that may be expected from the species. In all instances at Yield Class 18 the minor species have a lower return than Sitka spruce while at Yield Class 14 grand fir is the only one to have a higher return. These differences are attributable in the main to the effects of early growth on timing of thinnings.

The potential of the four species for British forestry are summarised in the final chapter. Grand fir will depend on its being more widely planted before it is of importance. Western hemlock offers little hope as it is outproduced by all the major species. Western red cedar grows well only in the southern half of Britain and is therefore of limited use while noble fir appears to have no future.

This publication achieves its aims in gathering together all the relevant data about the species concerned. In its presentation it is up to the usual high standards set by the British Forestry Commission. It contains a wealth of graphs and tables which clearly illustrate the points in the text. Its main fault lies in the limited number of areas and age classes surveyed casting some doubt on the validity of the graphs in Chapter 3, a point conceded by the authors. In the section on natural distribution of the species the northern extension of the Sitka spruce range is somewhat shortened. In addition its association with noble fir is somewhat of a surprise.

The conclusions drawn by the authors of the species usefulness come as an anticlimax. At £1.50 the bulletin will serve as a useful reference on the species performance in Britain outside of which it may be less relevant.

J. O'DRISCOLL