

BOOK REVIEW

**SAMPLING PLANTATION EUCALYPTS
FOR WOOD AND FIBRE PROPERTIES**

by G. M. Downes, I. L. Hudson, C. A. Raymond, G. H. Dean,
A. J. Michell, L. R. Schimleck, R. Evans, and A. Muneri

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This comprehensive book contains information on procedures for assessing the wood quality of plantation-grown eucalypts, with particular emphasis on non-destructive assessment techniques and prediction of whole-tree values from sampling at specific sites within the stem. Although the book focuses on *Eucalyptus globulus* and *E. nitens*, the techniques described may be much more widely applicable, not only to eucalypts but to many other hardwoods, and even softwoods, with modifications appropriate to each species. The book is targeted at those involved in assessment of wood properties for resource evaluation purposes but is also a useful general text on wood property measurement techniques and fills an important gap in the literature where publications on wood quality have been scarce in recent years. Much of the experimental work described is based on data acquired by the silviscan instruments located at the Forestry and Forest Products laboratory in Clayton. The book has been produced by the Cooperative Research Centre for Hardwood Fibre and Paper Science, and the Cooperative Research Centre for Temperate Hardwood Forestry, CSIRO, in response to a perceived need from forest management organisations to manage forests for particular properties and end uses.

The book is divided into six chapters covering wood properties, sampling, models of within tree variation, within tree sampling point correlations, sampling protocols, and tools for rapid assessment. There are also several appendices providing detailed data on variations in wood density, fibre dimensions, wood chemistry, and pulp yield, ensuring that both solidwood and pulping properties are covered. Two basic questions common to all wood quality studies are addressed; what are the patterns of variation within the tree, and where is the best place to sample to obtain the best prediction of whole-tree properties.

Chapter one describes wood properties such as density, fibre dimensions, microfibril angle, vessel size and frequency, and pulp yield, and relates these to wood quality. Each property is described clearly in anatomical, chemical, or physical terms and typical values are given both for wood in general and for specific species of eucalypt. This section of the book might have benefited from some additional detail and perhaps some better diagrams aimed at the less experienced reader but nevertheless forms a good introduction to the rest of the book. Of particular interest is the section describing emerging technologies for wood quality determination which deals with the two silviscan instruments and near-infrared

analysis (NIR). This section is rather brief and gives few details. Given that these techniques form the basis for many of the wood quality assessments being described, additional detail on specimen preparation and perhaps a photograph of the instrumentation would have been beneficial. Although the final chapter does address this to some extent, it does seem to be out of place at the end of the book and might have been more appropriate as a chapter following the introduction to wood properties.

Chapter two describes methods for collecting wood samples and the problems associated with particular sampling regimes. Non-destructive sampling is recommended for the temperate eucalypts due to the difficulties with vegetative propagation in relation to selection for tree breeding purposes. A number of breeding terms such as family and heritability are introduced, unfortunately with no definition in the text and only a brief definition in the glossary. Several wood properties are defined in terms of variability, heritability, sample size, and accuracy using a high, medium, low classification and in a subsequent table using quantitative measures such as coefficients of variation, and sample sizes. The diagram which attempts to define precision, accuracy, and bias is inadequate and confusing, and could easily have been replaced with clear verbal definitions using less space. The two examples of change in accuracy with sample size given for tree diameter and fibre length clearly show the benefit of optimising the sample size. However, the clarity of these figures could have been improved by labelling the y-axis as “accuracy” rather than “half width of 95% CI”. The caption to one of these figures fails to indicate what variable is being described and the reader has to refer to the text to find out that it is fibre length. Of particular interest is a table showing the relative costs involved in a range of density assessment techniques from pilodyn to increment cores and discs, which surprisingly shows a marked effect of species between *E. globulus* and *E. nitens*. An explanation of this effect would have been of interest.

Chapters 3 and 4 deal with modelling and sampling strategies and include recommendations for each wood property. For basic density and fibre dimensions (length and coarseness), it is extremely fortunate for those involved in collecting the samples that breast height provides the optimum sampling point. Further work is needed to define the optimum sampling position for other properties.

Chapters 5 and 6 deal with sample collection and assessment techniques for both destructive and non-destructive sampling, including a useful section on recommendations for sample storage. The authors emphasise the need to avoid allowing samples to air dry which will often induce collapse, rendering anatomical measurements meaningless. The appendices are perhaps of greater interest as they review the documented variation of wood properties for a range of eucalypt species, including variation related to provenance and family, site, and silviculture, within and between trees, and correlations with growth rate. These summaries and an extensive bibliography will be of interest to all involved in wood quality assessment of eucalypts. The glossary of technical terms, while useful in itself, could have been supplemented with additional explanations within the text.

“Sampling Plantation Eucalypts” will be an essential reference to all those involved in assessment of wood quality in eucalypts, ranging from foresters to tree breeders. This well-presented text serves to highlight the need for a similar treatment of softwood plantation species, in particular radiata pine.

CORRIGENDUM

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**INTERNATIONAL GENE POOL EXPERIMENTS
IN *PINUS RADIATA*:
PATTERNS OF GENOTYPE-SITE INTERACTION**

R. D. BURDON, S. O. HONG, C. J. A. SHELBOURNE

New Zealand Forest Research Institute,
Private Bag 3020, Rotorua, New Zealand

I. G. JOHNSON

State Forests of NSW Research Division,
P. O. Box 100, Beecroft, New South Wales 2119, Australia

T. B. BUTCHER

Department of Conservation and Land Management, State Operations Headquarters,
50 Hayman Road, Como, Western Australia 6152, Australia

D. B. BOOMSMA

Southern Tree Breeding Association,
P. O. Box 1811, Mt Gambier, South Australia 5290, Australia

S. D. VERRYIN

Division of Water, Environment and Forestry Technology,
Envirotek, P. O. Box 395, Pretoria 0001, South Africa

J. N. CAMERON and R. APPLETON

Australian Paper Plantations Pty Ltd,
P. O. Box 220, Morwell, Victoria 3840, Australia

Page 120, lines 5–6,

for “... Johnson’s results (1996) for just the three New South Wales sites ...”
please read “... the results of Pederick (1990) from four sites in Victoria ...”

REFERENCE

PEDERICK, L.A. 1990: Family \times site interactions in *Pinus radiata* in Victoria, Australia, and implications for breeding strategy. *Silvae Genetica* 39: 134–140.