





Quick-growing, dense plantations provide straight, slender stems free of branching. And they lend themselves to mechanical harvesting every few years.

reflected the nature of the parent wood. They usually had a parallel grain, with some overlapping strands that reduced the tendency to split.

The processing averages out imperfections originally present in the wood. The product, which has been given the name SCRIMBER (registered trade mark, Repco Ltd), usually has some 70% of the bending strength of mature timber, and good compression properties too. It can be sawn, planed, and sanded. And it will retain normal fastenings.

Seeing a commercial opportunity, Repco Research Pty Ltd has further developed the process, in collaboration with CSIRO, and is currently building a demonstration plant.

Materials-handling and drying systems need some adaptation to enable them to cope with larger bundles of strands. But otherwise these basic processes are well understood and, with the exception of a specially

designed reduction mill, no new technology is required.

Conditions for pressing and curing the strands are likewise similar to those required for particle board, although the team is investigating the use of high-frequency heating (really a large microwave oven) for the curing step in the demonstration plant. If perfected, it would speed up the process and, being more uniform, may improve the quality of the product.

In their laboratory trials, Mr Coleman and his colleagues found that tree stems of about 80- to 160-mm diameter, cut to the length of the final product, gave the best results.

Short-rotation, quick-growing, coppiced trees provide satisfactory raw material of this size. The stems are slender, uniform, relatively free of branching, and generally easy to process. Moreover, they contain neither heartwood nor well-formed knots, which compensates to some extent for the initial disadvantage in the lower strength of juvenile stem wood as compared with that of wood from mature trees.

The young stems could be grown in closely spaced rows, and mechanically harvested in a cycle varying from 4 to 8 years depending on the species, soil, and climate. It may be possible to establish tree farms close to markets for reconsolidated products.

Systematic and sustained wood production would be desirable as the basis for a commercial operation, to simplify processing and give a uniform product. It makes sense as an investment given the time needed to bring a forest to full maturity.

However, it might be possible also to utilize

thinnings from established forests or alter the management regime of stands intended for logging to provide an early cut for SCRIMBER. In any event, the tendency would be to reduce pressure on natural forest or enable countries presently without forest to manufacture acceptable wood substitutes.

The team has evaluated the suitability of a number of commercial species. Among the eucalypts tried, manna gum (*Eucalyptus viminalis*) performed particularly well and river red gum (*E. camaldulensis*) was satisfactory. Silver wattle (*Acacia dealbata*) and some poplar clones gave satisfactory results also.

On balance, radiata pine proved a good all-round performer.

This familiar softwood grows fairly rapidly and splinters readily. However, it does have a spiral grain, which presents some difficulty, especially in younger stems. In the long term, this twist may be selectively bred out. Meanwhile, this species has been selected for the purpose of designing the equipment.

Wood put through the SCRIMBER process can be tailored to satisfy a range of specifications. For instance, the strands can be moulded in two directions, or even pierced during the pressing operation.

Mr Coleman has prepared, in the laboratory, a three-dimensional lacework in a rectangular section, forming a flanged beam. Sinuous pieces could be made for assembly into lightweight trusses. It is also possible to laminate SCRIMBER to veneers during moulding, giving a very pleasing surface finish. Even the density of the product can be controlled.

Several options are being considered for commercial products. Apart from deep structural sections, uniform, lighter elements could be produced for the high-volume building market. Other possibilities include products with significant market volumes but no critical performance requirements, such as skirting board.

Patents are being taken out covering the production of moulded articles, pallets for example — to take advantage of the unique nature of the process.

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A 'reconsolidated' structural wood substitute. J. D. Coleman. *Proceedings, Forest Products Conference, Melbourne, December 1981.*

A 'reconsolidated' structural wood substitute from radiata pine. J. D. Coleman. *Papers, Appita Conference, Rotorua, April 1981.*

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