

## MONEY FROM TREES

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### Introduction

The primary objective in growing production forest is one of commercial return. Logs produced from a forest have no end use as such without further processing, hence the value of any log can only be determined by working backwards through the value chain from a suitable wooden end product.

Growers are often too far removed from the end product market to either see or gain any real knowledge of what they are producing logs for. Given that our radiata pine is one of the most diverse woods in the world, with widely variable traits from inner to outer log, top to bottom of the tree as well as from site to site, this creates complexities for all processing sectors including the forest grower.

The logging industry therefore is but a small part of a chain of production costs, each of which may contribute or derogate to the profit of industry as a whole and this profit can only be measured once the end use products have been manufactured and sold.

Whilst logging costs are an issue, value creation is far more important and should be the primary focus of any forest harvest. The costs of wood manufacturing are far more significant than the cost of logging, hence getting the right log to the right place to make the target product is the right objective.

In tough times like the present the focus of the whole industry chain must

combine to produce the "rightness" at every transfer point along the way. A failure at any one delivery point means failure at all subsequent points, with corresponding real dollar losses to all who are involved. If, for example, our logger consistently produces less than optimal logs for the targeted manufacturing, the manufacturer can only pay less than optimal price for the infeed logs. If the forester grows a product that is less suitable or even unsuitable for high value end products then that wood will be priced for low value end products. Integration of our sectors from tree breeding through the chain to end product sales, together with in depth intellectual skill in forestry is what is needed to set us ahead of our competitors. We must strive to understand what it is that creates valuable sales and then gain the technological understanding of how to improve each performance step in the value creation chain.

### Looking At Products

When considering growing of the trees one must look beyond the many detailed end use products which change in fashion and usage and look more to the wood traits which the market calls for. Basic wood traits in the high, medium and low value brackets have remained the same for centuries. The highest value wood is quarter sawn clears - hence we must maximise the volume and quality of those logs which are suitable for quarter sawn clears. Second on the value list is flat sawn clears, followed by small knot structural grade lumber, then large knot lumber and juvenile pulp type logs. Then, when we consider the

maximisation of value from the logs out of that tree, the traits which need to be maximised in the highest value quarter sawing log include :

- clear sapwood over heart and over the knotty core
- low taper, low sweep
- straightness and closeness of grain (annual rings).

These traits are not just block specific as the single tree genetics and micro climate have a big effect on the quality of the pruned log. Hence the logging industry must sort these pruned logs by carefully assessing the qualities and segregating them for the customer. If we send mixed quality pruned to the sawmill, then the average quality is lowered and rather than saw high grade quarter sawn lumber the miller is more likely to saw lower value flat sawn lumber. Simply a loss of opportunity, and a loss of value. When the miller turns out a lower value product the log price must be correspondingly lower.

Another example would be our unpruned logs. Their diameter, a factor we have sorted by for decades, is nothing more than an indicator of productivity at the mill. The critical factors we must sort for are knot size and knot frequency (knot ratio), juvenile core to adult wood depth and log density (or position within the tree). Again these factors vary so much from tree to tree and from stand to stand. A heap of unpruned logs presented to a plymill or sawmill with mixed density, mixed knot ratio and of variable adult wood depth will not produce a consistent quality structural product. As a result, manufacturing costs will increase, the volume of low

grade out put will increase and the quality of the high grade output will decrease. Lower value returns to the log seller will inevitably result.

### Which Logs For What Lumber

Does the market dictate the log grade or does the market take what the forest can produce?

Consider for a moment MDF, box grade or packaging lumber. We can send basically any type of log and the product will be of similar quality and value. At the other end of the spectrum we look at sliced veneer for cupboard facings, quarter sawn clears for door frames etc. and the log quality is critical to the product out turn. Middle of the road structural lumber manufactured by sawing or peeling relies on knot ratio and density to achieve the required product quality.

When we log in a very uniform fashion following the road or age class through the forest we give no consideration to just what our customer needs from month to month. Should we not be gaining a very detailed knowledge of what our customer is going to be marketing over the next month or two then choosing the blocks that best suit the ratio of their detailed requirements.

When we log and manage our skid site with a processor head, we cut and sort logs basically by length and with some vague eyeometer or diameter and knot size. Other parameters cannot be quantified in this mass production. Any customer purchasing logs from this type of operation has two choices :

- a) resort the logs looking at the detailed quality parameters. This is not so efficient because once pre-emptive cuts are made it is difficult to get millable lengths of specific grades from such logs.
- b) process the variable quality logs into a lower average grade of product with correspondingly lower value.

If by contrast we have a customer who is making a particular grade of LVL or ply, we can study the product and manufacturing process and come up with a log specification that will ideally suit. Then conversion, productivity and quality will be optimised, end users will be satisfied and in turn the profits will pay for a higher log price.

Our typical log exports from NZ do not align to such a strategy. J grade, K grade, etc are very mixed quality (run of bush) logs and that is one principle reason why our price is always much lower than competitors with Meranti or Douglas fir. Meranti and fir, two common competitors in the high grade lumber market are by comparison to radiata very consistent in their wood properties from top to bottom and inner to outer log. By sending this run of bush type log we tend to encourage radiata out of the high value end use markets.

Currently, there is no technology available to mechanise the detailed grading of radiata into log sorts. LIRO, Forest Research and others are busy working on this but it is unlikely that a total solution will be developed quickly. More likely those who choose to properly grade logs for specialist end use

will need to process manually until real solutions are developed.

### Market the Specific Raw Materials

The whole secret in extracting value from trees is in alignment to the manufacturer and the end user. Without a detailed knowledge of the end product, the manufacturing processes and the technicalities of the resource, there is little hope in achieving the "rightness" of the logs.

In JNL's case the market products are studied in great detail for attributes such as strength, colour, growth ring spacing or appearance, straightness of grain, stability requirements, knots and other allowable defects, etc. Similarly the forest and substand knowledge must be detailed so that particular forest areas can be targeted to meet certain markets. Creating the right logs for downstream processing is a function of integration between the forest establishment group and all other parties through to the end user. Integration on a daily basis rather than infrequent visits or meetings that barely scratch the surface of real issues.

Tree felling age is a great example of NZ's current lack of whole industry integration. If you look at the straight economics of tree growing the accountant would say in isolation that on reasonable sites with higher GF we should fell at age 22-26yrs. But as soon as you amalgamate the returns from processing its easy to see that felling below 28 years of age is a sunset industry and 30+ year old trees will provide stable profits for all sectors of the industry.

Another example already mentioned is the mechanisation of logging without due regard to log sorting. The drive to save a dollar on logging costs is very secondary to creation of value in product. In JNL's case this is so paramount that logs are not cut at the forest, we are transporting longs (13.4m) to the mill log yard for detailed cutting.

### Achieving Value

A full understanding of products and manufacturing technology is a cornerstone to the success of log marketing and therefore forest log production. Our industry seems to be transfixed with cost reduction rather than value creation. Costs are of course a major concern. NZ's forest harvesting costs have escalated beyond our competition over the past six to eight years. But the creation of higher value products must be the major goal of our industry.

Considering log value at mill, of which harvesting is a component cost, the significance of that can be measured in several tiers in relation to end use products.

Lets consider the mill sawing framing lumber using S1 type logs - log input value around \$85/tonne - product output value around \$380/m3 average then after conversion from log to lumber the log cost is some 45% of the product value. Compare this with a mill sawing high value furniture / finishing components from the best pruned logs - log input value around \$180/tonne - product output value around \$1100/m3 average, then after conversion from log

to lumber the log cost is some 33% of the product value.

One could argue that clearwood always attracts a premium over structural grades so to cement a point lets compare run of bush S1 log to selected S1 log for structural LVL or structural ply. By selecting for central pith, density and knot ratio the grade of product can increase product value by \$250/m3, the yield and productivity through the mill can increase by 15% with an overall value increase of around \$400/m3. A significant proportion of this can be reflected into log value if the supplier can guarantee consistent supply at the specific quality.

Clearly the creation of higher value products starts with the forest grower, is pre-empted by those cutting trees into logs and continues through the processing and marketing sectors.

### Key Goals For Profitability

The forest grower and its harvesting group must align themselves very closely to the processors and their markets. To comprehend this a technical understanding of radiata wood technology will help immensely. Otherwise a forest harvesting manager standing in a modern mill can understand about as much as a sawmill headrig operator trying to plan a cable logging operation.

In today's ever competitive world NZ is constantly slipping backwards in terms of its competitiveness. In 1996 we were ranked as 3 best, by 1998 we had slipped to 8th place. NZ has prided itself on Kiwi ingenuity but we seem to have lost

this edge. Constant restructuring of industry has reduced the corporate skills base, the historical knowledge and the ability to study new technology. Technology improvement is likely to provide by far the majority of value creation over the next decade and beyond. Value creation will not be achieved by major cost reductions at the expense of product quality.

Education, beyond the level of the basic tree felling and the like, will be essential for future efficiency gains in harvesting. The physics of cable logging, the mechanics of yarders, engineering economics, the management of people and business are higher level skills that most principle contractors and their foremen do not have. The challenge is in getting this sector of industry to accept the need and invest in the education.

Industry leaders, dictated to by a predominance of log export markets are savage on contractors business. One minute contractors are expected to overproduce the next they're on quota or shut down. This can only increase the unit cost of contractors production and in the longer term it creates an exodus from the industry as people head away for more secure opportunities, including the financiers. This is a major hurdle that we need to overcome. Even in the processing industry there will be highs and lows, to a lesser extent, which Juken are now handling by establishing a percentage of company owned logging crews. In effect our contractors will operate unconstrained, whilst the JNL owned crews will take the fluctuations. When the JNL logging force has to be curtailed the company can swing into roading, thinning to waste and other

useful planned work without interfering with regular contract operations.

Logging costs must be reduced through education, innovation and stability but at the same time loggers profitability must increase. This will be a lengthy process and one that requires stable partnerships between corporates and their loggers.

In conclusion, the road forward will not be tarseal for some time yet but will get smoother through integration, innovation and partnerships throughout the forest industry.

