PRUNED PINE

CLEAR OPPORTUNITIES FOR NEW ZEALAND WOOD PRODUCTS?

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THE GROWER/PROCESSOR INTERFACE

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The clear and logical way to approach this paper is to describe methods of assessing pruned quality of the forest resource, explain the methods of determining quality of logs being processed and then how to match those two sets of data in a formula that allows both Grower and Processor to share the log value in a fair and equitable way. Sounds easy but so does ‘Beat the Aussies at rugby’ if you say it quick enough.

There are a large number of complications. Firstly there is currently a vast range in effort or interest in resource quality description by forest owners - and many who do have information seem to think that in allowing the processor to see those data the only result will be a lower price! Secondly there are complications of sale type (stumpage, landed etc.), scale and contract length. Thirdly, there are external factors unrelated to the profitability of this particular market (such as the recent collapse in the export market of lower log grades impacting on pruned log availability as forest owners reduced harvests to balance the overall log production). Finally, there are impacts of appearance market fluctuations. At the moment it is relatively common for me to hear growers say they want more money for their logs based on our final market prices increasing. They were all pretty quiet when the FX and low US prices of a year ago saw all of us in those markets losing money because growers refused to lower log prices to a level where any profit was possible!

From the processor point of view there are also many ways of confirming log quality depending on mill size, number of log sources and required accuracy of data, and whether the particular defect needs to be assessed before or after drying. Last month our pruned sawmill received log supply from about 20 different forest owners with differing levels of information transfer in terms of volume and quality descriptions. The mill runs twenty-four hours a day and seven days a week. The headrig grabs a new log about every 55 seconds but our need to understand the resource is such that we still manage to run trials throughout the day to establish return-to-log by source, and have developed techniques that have minimal disruption to through-put.

And finally there is the delivery mechanism. Are the logs delivered when required and are they in spec? I would like to meet the log maker who can consistently cut logs to correct lengths. He is an extremely rare individual. And it is no good delivering logs that are full of sapstain. By our definition these might as well have knots as they won’t make any product that we sell. In the peak of Summer the window of delivery may be as low as 1 week as sapstain development is temperature related. Where there is consistent inadequacy in delivery then the price mechanism should represent this.

With all of those complications it is inevitable that we use a range of methods for determining that elusive ‘fair price’ and how it should vary from month to month and certainly no one method suits all.
Resource Description.
Why would a forest grower ensure that he minimised defect cores in a pruned log if he was not going to be rewarded for doing so? And why if one forest produced better quality logs than another would they not be rewarded in the market place?

When Tenon was Fletcher Challenge Forests we managed over 100 different forests where a second party was involved. These ranged from cutting rights, through stumpage shares to simple management contracts. As part of the management of each relationship it was necessary to be able to show that the maximum returns were being achieved for each partner and that any sales to our own mills were a ‘fair market price’. To do this we developed log grades based on PLI (Pruned Log Index), a measure of resin incidence and of intra-ring checking. Secondly we tracked all of our sales from individual stand to customers (domestic, export and internal sales) and used a formula including volumes, average price and average quality to the external sales to determine a fair internal transfer price.

We attempted to introduce the concept of pruned log grades to our domestic customers but with only one real success. This resistance to the concept of paying a price based on known quality rather than a basket average (the ‘lucky-dip’ approach) always confounded me then and still does now. Some of the opposition to the idea I am sure was built on a distrust of the relevance of the data despite all of the research efforts from people like Jim Park and Alan Somerville (both now ex Forest Research) and others, but also a general distrust of the ‘large corporates’.

However, the above process, plus the desire to maximise our own returns through resource knowledge and understanding led us to develop a range of systems and methods to describe the variability of the 200,000+ hectares that we owned or managed.

Sale area or stand can be assessed using a formal survey, such as that offered by INTERFACE Forest & Mill, to encompass the size variability and geographic distribution in a structured scientific sample. This gives predictions of all three properties and some ability to look at effects on quality of holding harvest for the future or of segregating into log grades by size. Included are a range of resinous defect descriptions and a full analysis of the occurrence of the checks. It is the role of each mill to understand how these apply to their own product line or processing capability.

But there are short cuts. My first stage was to model PLI to determine whether a more thorough analysis was warranted. There are now two spreadsheet type tools available, which take inventory diameter measures and link these to a known defect core (DC) or diameter over stubs (DOS). These tools are Jim Park’s PLI Estimator (see Figure 1) and Christine Todoroki’s PLI Calculator (available via the FR web site).

If you have good stand records you can estimate the DC using the Forest Research STANDPAK model. If you have really good records then DOS should have been recorded after each pruning lift and DC is a simple calculation of occlusion. But
remember these methods are strongly dependant on the maxim ‘Rubbish in – Rubbish out’.

Figure 1. A simple method of determining stand PLI

Another relatively recent research development is the understanding of the relationships between features on the stem of a standing tree and resulting resinous downgrade in lumber. This has provided a method of stand assessment for resin related degrade. Application is during pre-harvest inventory and can be built into either MARVL or YTGEN assessments so providing information relatively cheaply. Table 1 shows an example from one trial, of the difference in value of lumber sawn from batches of logs selected using this method. Prices used were a yearly average price list based on Crow’s published data.

Table 1. Value of random width lumber at mill door

<table>
<thead>
<tr>
<th>Stem Selection Category by Feature Severity</th>
<th>Clean</th>
<th>Low</th>
<th>Moderate</th>
<th>Severe</th>
</tr>
</thead>
<tbody>
<tr>
<td>NZ$/m³</td>
<td>$678</td>
<td>$620</td>
<td>$594</td>
<td>$476</td>
</tr>
<tr>
<td>Value decrease, %</td>
<td>na</td>
<td>8%</td>
<td>12%</td>
<td>30%</td>
</tr>
</tbody>
</table>

Unfortunately, due to the random variability of biological systems, this assessment is not reliable on an individual tree basis but does enable a broad resource quality prediction.

Similarly, intra-ring checking assessments can only be carried out on a stand average basis but this is probably all a mill would require in terms of effects on quality. There is no short cut, yet, to this property.
Mill Assessments
Carrying out load or batch quality assessments should be a routine practice for all pruned log mills. Mills should know the relationship between PLI and their target products, and should have at least an understanding of the effects of resin and intra-ring checking on down grade. On the green chain a grader can identify a big fat wet resin pocket but it is only after surface dressing that the effects of resin streaks, resin blemishes and the ‘dry’ resin defects can be realistically determined. This is where some structured trials are required to establish relationships between these features in your product and the forest assessments.

Similarly you cannot assess intra-ring checking unless you track product beyond the kilns and you also cannot assess severity unless you at least surface dress the product because, except in extreme cases, you cannot see checking on lumber surfaces. However this technique is not reliable or applicable on an individual log basis and so should only be applied as a stand average. We use these data to act as a warning of severity. Above a certain level and we can’t successfully process the log out-turn, below a certain level and we know we will have very low (acceptable?) levels of downgrade and in the middle, so long as we are forewarned, we can alter our processing to accommodate the expected higher checking propensity.

The key here is ‘information sharing’. Forest owners could ignore this issue, and we could either take big random losses as slugs of check prone wood were supplied, or add huge processing costs to all of our supply (just in case it is check prone). Subsequently our profitability and therefore our ability to pay a ‘fair’ price for logs would decrease. Fortunately in our neck of the woods we deal mostly with enlightened forest owners have been prepared to assess their resource for IC and grade their logs accordingly.

Setting a ‘Fair’ Price
If we are sensible as an overall industry, then both grower and processor want each other to actually continue as a viable component. We need each other and therefore log price negotiations should be a compromise not a contest. This scenario assumes that both will share the good times, and both will share the bad. This certainly hasn’t been the case in the past but could be for the future.

I have played with a concept of linking monthly log prices to changes in our mill recoveries and clearwood percentages for that particular resource. This would rely on the supplier believing our mill recoveries and on our having a representative sample measured through the period in question. The mill grade recoveries (see Figure 2) represent the effect of basic resource quality changes (PLI or resin differences between stands for example) and the conversion rates is affected by log size and sweep and also out of spec logs supplied (under/over length logs, undersize etc.).

The model would be based on changes between months but would have to be linked in some way to the ‘market average log as that varies according to other external effects.
Where we have large volumes of contracted supply from a single source a price differential based on quality is almost essential for both parties, and we are working towards this with all of our major suppliers. In this case the grower must provide data on expected harvest in some detail to assure us that the overall quality is acceptable. Once we have established an ‘average’ planned quality to set the base price upon (another fish-hook), then using our mill data to establish a value differential between grades, and the expected percentage of supply by that grade from the harvest plan, we can set an adjusted price per log grade. Once this price differential is established the grower then has the ability to alter harvest plans where necessary, and therefore grade percentages, without any undue overall effect on our mill. Should someone else offer a higher price on any particular grade then the grower can take advantage of that by exchanging the volume in some other grade to us. Figure 3 gives an example of how this might work.
Figure 3. Price/Log Grade Differentials based on expected ratio of supply

<table>
<thead>
<tr>
<th>Grade</th>
<th>Differential from PE</th>
<th>Planned Supply</th>
<th>Log Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>PE</td>
<td>28%</td>
<td>$40.53</td>
<td>$144.75</td>
</tr>
<tr>
<td>P4</td>
<td>-$6.21</td>
<td>15% $20.78</td>
<td>$138.54</td>
</tr>
<tr>
<td>P5</td>
<td>$3.78</td>
<td>35% $51.99</td>
<td>$148.53</td>
</tr>
<tr>
<td>P6</td>
<td>$12.99</td>
<td>22% $34.70</td>
<td>$157.74</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$148.00</td>
</tr>
</tbody>
</table>

Target Price

Enter planned supply data as provided by Forest Grower

Use ‘Goal Seek’ under ‘Tools’ menu to solve for PE Price using agreed (Target) price

The simplest, and my least preferred method of setting a quality/price differential is to simply set a gradient based on PLI. This ignores all effects of the other biological variables (resin, checking, log diameter etc) and I think must inevitably result in a lack of surity to the processor. Again this relies on an initial agreed price (Figure 4).

Figure 4. Price by PLI

<table>
<thead>
<tr>
<th>Grade</th>
<th>PLI Range</th>
<th>Log Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>P4</td>
<td>4 to 4.9</td>
<td>$138.58</td>
</tr>
<tr>
<td>P5</td>
<td>5 to 5.9</td>
<td>$145.18</td>
</tr>
<tr>
<td>P6</td>
<td>6 to 6.9</td>
<td>$151.78</td>
</tr>
<tr>
<td>P7</td>
<td>7 to 7.9</td>
<td>$158.38</td>
</tr>
<tr>
<td>P8</td>
<td>&gt;8</td>
<td>$164.98</td>
</tr>
</tbody>
</table>

Average PLI = 5.7

Negotiated Price = $146.50

So I have described a lot of fancy spreadsheets and alternative methods of segregating quality by price, but all of these solutions involve sitting down, face-to-face, and establishing an acceptable starting price. I have no magic wand for this one. Both Agrifax and MAF track ‘average’ prices (Fig 5) but these have no bearing on quality. Agrifax is based on mill door but the MAF data is simply the mid point from a range of sale conditions.
So a grower who thinks he has something better than average must first convince the processor. There are really only three ways. Provide enough data of the appropriate measures to convince the processor that his supply is superior than the rest; supply enough loads for the processor to trial to his own satisfaction that out-turns are better than average and are also representative of the whole stand; or the current BS where neither party trusts the other. Personally as a new boy to the forest/mill interface I favour a bit more openness and sharing of both information and ultimately profits.