Pruned log descriptors

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Introduction

A prime motivation in creating Pruned Log Index (PLI) in the mid 1980s and subsequently developing practical stand sampling systems based around PLI was to provide methods for determining pruned log quality based on measurable log parameters only. The index needed to remain independent of, but directly relate to, clearwood recoveries by any sawmill. Those objectives have been achieved and after proof in numerous sawing trials PLI has been accepted nationwide as the appropriate measure of basic pruned sawlog quality.

However the underlying motive of installing PLI, augmented by other essential quality measures such as resin pocket incidence, as the prime determinant of quality in log price negotiations has been largely frustrated. Return To Log (RTL) type studies completely controlled and conducted by the sawmill (i.e. the customers for logs) remain the norm. While such RTL studies may constitute an essential element in sawmill’s purchasing decisions and general mill efficiencies, they will always be biased, to at least some degree, in the sawmill’s favour and cannot provide a neutral definition of pruned log quality.

It is readily conceded that pruned quality does not equal pruned price. There are a number of issues influencing pruned log prices with quality being just one of the components and, unfortunately for the better grower, not always the most dominant one. Regardless, quality inevitably has an impact on price and a purpose here is to further promote independent measures as the fairest and most appropriate determinants of pruned log quality.

Pruned stand sampling remains the most reliable and unbiased method of determining pruned quality. Interface sampling systems are based around PLI but also include gathering data and producing results on the incidence of random defects (principally resin pockets), intra-ring checking index (IRC), other properties such as percentage heartwood and percentage corewood if requested, and Clear Veneer Potential (CVP) for pruned logs as peeers.

A sensible first step in any examination of pruned resource is the prediction of PLI. When stand records are good and silviculture has been well applied and consistent, PLI can be accurately predicted. However, even in the best situations some element of doubt remains. Additionally resin levels, IRC and CVP have all proved impossible to reliably predict. Consequently, although predicted PLIs have, and will doubtless continue to be, presented as the prime quality measures in some price negotiations, the unknowns and levels of risk are both increased to the point where sawmills are virtually forced to insist on adjustments based on their own RTLS.

The purpose in preparing this note is to present a proposed system of pruned log descriptors to improve pruned log trading practices. Hopefully it will provoke thought and generate some discussion.

Pruned Log Descriptors

Good descriptions of pruned logs are in the best interests of all concerned and, although eventually likely to prove most useful to the end-user, should also assist in better informed price negotiations. At present for most purposes pruned log quality can be defined by three elements: basic sawlog quality expressed by PLI; resin pocket incidence expressed as the number per square metre of sawn surface area; and intra-ring checking defined by the index (IRC) developed at Forest Research. Stand level definitions of those three variables are the most frequent and conveniently adopted measures of basic quality. Acknowledging the need not to get overcomplicated, I believe those three stand variables could be combined into Pruned Log Descriptors which may be similar to, but more flexible than, standardised log grades.

There is one additional issue in defining pruned logs for marketing purposes; and that is whether PLI has been calculated from sampling or has been predicted.

My suggestions for PLI based pruned log descriptors are as follows:

1. Pruned logs are identified by P and basic quality is expressed in single increments of Stand PLI; e.g. P6, P7, P8 etc.
2. Stands or logs that are predicted only are identified with a second P; e.g. P6P, P7P etc.
3. Stands that have been sampled will always have a PLI number plus a qualifier for resin pockets according to one of 5 incidence classes ranging from A to E (see following section for details); e.g. P7A, P7C etc. (The suffixes A to E will serve a secondary purpose in confirming that a stand has been physically sampled.)
4. Stands with unacceptably high checking will be identified with a Z. As some predicted stands do get sampled for checking only, a Z may apply to both predicted and sampled stands; e.g. P7PZ for a predicted stand, P7CZ as an example of a sampled stand.

At present, in one mill at least, checking on the IRC scale is either acceptable, if <0.4, or logs are downgraded if >0.4, and not accepted where >1.00. That standard may not suit all and wider consultation is required so the examples in item 4 above may be regarded as a starting point only. Currently the Z is used as an either absent or present flag signalling potential problems when present. However, it would be simple to accommodate say three classes of checking by using X, Y and Z as suffixes if required.

As a point of interest, we have now sampled several stands that were PLI 10+. So far the highest stand PLI recorded has been 11.5.

Resin Pocket Degradation Classes

There are a range of randomly occurring defects which
may cause degrade to otherwise clear timber. When any of them are present in significant numbers they must be accounted for and accompany PLI results. The most common random defects, which must always be accounted for, are resin pockets. These are present at some level in all New Zealand stands of radiata pine.

The incidence of resin pockets (rp/m²) is defined as the number observed per square metre of sawn surface area in timber from the clear and intermediate (clear-cuttings) zones of pruned logs.

Degrade due to resin pockets varies depending on the combination of numbers present, their sizes, the timber grading/market criteria and the basic pruned log quality (PLI). Over the past 12 years Interface has derived market specific degrade factors for resin pockets and associated defects. That approach has now been abandoned because clearwood markets have become much more diverse and mills servicing similar markets have differing grading criteria. Rather, we have reverted to the generalised interpretations of resin pocket levels which were derived from 11 detailed sawing studies conducted in the late 80s and early 90s. Those generalised degrade classes have stood the test of time, remain directly relevant and are summarised in Table 1.

### Table 1: Generalised Resin Pocket Classes

<table>
<thead>
<tr>
<th>Log Descriptor Class</th>
<th>Resin Pockets (rp/m²)</th>
<th>Degrade Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>&lt;0.40</td>
<td>'Clean'</td>
</tr>
<tr>
<td>B</td>
<td>0.40 - 0.79</td>
<td>Minor</td>
</tr>
<tr>
<td>C</td>
<td>0.80 - 1.19</td>
<td>Significant</td>
</tr>
<tr>
<td>D</td>
<td>1.20 - 1.99</td>
<td>Problem</td>
</tr>
<tr>
<td>E</td>
<td>&gt;2.00</td>
<td>Major</td>
</tr>
</tbody>
</table>

The Log Descriptor Classes A to E in the left column of the table are the resin pocket incidence classes referred to in the previous section on Pruned Log Descriptors.

The ‘Clean’ degrade class covers background levels of resin pockets present in all stands and should never warrant price adjustment. Logs in the Minor degrade class should experience few losses if cut to Mouldings and should also be generally very acceptable for most other purposes. Logs with Significant levels of resin pockets are in the transition and will prove more readily acceptable to some end-users than others. The remaining two classes are well described, for all purposes, by their names.

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**Education news: Enrolments up**

**Enrolments up at University of Canterbury School of Forestry**

There are 32 first year forestry students enrolled at the School of Forestry in 2005 together with nine first professional year forest engineers – an increase of over 50% on 2004. The increase is a result of a number of factors including:

- an effort led by Associate Professor Euan Mason (with financial support from Carter Holt Harvey Forests and Wenita Forest Products) to increase the awareness of high school students and their careers advisors about forestry;
- the profile of the School being raised by Scholarships offered by companies as well as the University of Canterbury.

**Undergraduate Scholarships for 2005**

Winners of Scholarships for 2005 are:

- **Ernslaw One**
  - Chris Pedley, Rotorua, BForSc
- **Kaingaroa Timberlands**
  - Sally Haddon, Nelson, BForSc
- **Nelson Pine Industries**
  - Jacob Saathof, Hastings, BE(For)
- **Rayonier New Zealand**
  - Blair Cooper, Cambridge, BForSc
- **Weyerhaeuser New Zealand**
  - Rebecca Coles, Timaru, BForSc
  - Lawrie Scott, Nelson, BForSc
- **University of Canterbury Emerging Leader Scholarship**
  - Sarah Orton, Papakura, BForSc

**Postgraduate research scholarships**

Two of the first 20 recipients of New Zealand International Postgraduate Research Scholarships will study at the School of Forestry in 2005. The scholarships are part of a new international scholarship scheme announced by the Government in May last year.

- **Horacio Bown** from Chile is undertaking PhD studies on the “Impact of nutrient availability on conversion efficiency of solar radiation into biomass of radiata pine plantations in New Zealand”.
- **Julian Moreno** from Mexico is doing his PhD on “Prediction and segregation of wood properties for structural use and solid products using acoustic and other non-destructive methods”.

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Photo 1: Some of the 2005 undergraduate scholars at the School of Forestry (left to right: Sarah Orton, Rebecca Coles, Lawrie Scott, Sally Haddon, Jacob Saathof).