It was late 1992, and the FOB export price for pruned logs made its first sustained crossing of the $200/m³ threshold. The run was good it lasted 14 quarters and peaked at over $400/m³. Was this the prophesised premium of Fenton & Sutton that would make the disciples of “value not volume” foresters wealthy? Now almost 20 years later the reality of two decades of diminishing returns for pruned logs makes it increasingly hard for clearwood devotees to remain true to the faith.

Taking the biblical metaphor another step, this southern forester, once an ardent practitioner of intensive pruning and thinning finds himself – like the doubting disciple Thomas – needs to see hard evidence that value of pruned clearwood logs are indeed to be realised once again before he is prepared to once again invest in pruning. What are the alternatives? How do we retain flexibility whilst maximising potential profitability?

Sadly for our industry, like most commodity products before it the 4-quarter average log FOB price for all radiata grades have shown a long term decline in value (figure 1). When CPI adjusted the “real” return looks even more woeful. Any hope that our value added domestic industry could turn the flow is dashed when faced with the reality of a domestic price index consistently behind the international price, belying an industry struggling to compete with export markets for logs.

Like the trees we grow foresters are a hardy and long suffering bunch. Despite costs of pruning and thinning increasing dramatically and an almost relentless slide in prices for our pruned product we persevered for many years – always believing and hoping.

Whatever the reasons for the decline in fortunes of pruned radiata (oversupply, poor marketing, changes in fashion, shifts in economic power and/or substitution by products derived from cheap oil), radiata seems destined to occupy the cheap structural and utility segment of the solid wood market. Figure 2 shows the long-term trend in the export FOB price for Pruned logs relative A and K grade logs. Whilst the price differential paid for pruned and A grade has steadily closed for the past 20 years, it is also noteworthy that the price paid for K grade industrial quality logs has also approached both Pruned and A grade.

Expressed a different way we can see that the ratio of A-grade price to that of pruned logs dropped from 62% to less than 50% for the decade from 1993, but since 2004 has risen to its current position of 74% of pruned price (figure 3).

The Southern growers face further challenges when aiming at structural end uses. Cooler temperatures by reason of latitude and altitude combine to make it difficult to produce a high recovery, from radiata at least, of the desirable MSG 8 and better lumber sought after in construction.

Current radiata pine regimes practised by southern growers are designed to maximise volumes of quality structural and or utility grade saw logs suitable for export markets. Generally speaking, domestic saw millers continue to struggle in the international lumber trade and so long as the local economy is in the doldrums they seem forced to follow export prices rather than to be market leaders.

To succeed against alternative systems, above all else timber must be fit for purpose. This can mean many things depending on the end use, but this author considers it is safe to assume that stiffness and...
stability at the very least will be sought after requisites in structural markets. Furthermore, consistency and predictability of claimed characteristics will be required by discerning users. Changes in building codes worldwide point to a future where greater predictability of the responses of structures to internal and external forces will be required. The author believes that this will result in an increase in the use of remanufactured wood products such as LVL and CLT in particular.

Despite the variability of the resource at one end of the supply chain and the real importance of structural robustness of buildings, timber or otherwise framed, at the other end, currently, neither local or export markets offer any premium for logs with superior MoE or any other measure of wood stiffness.

It seems to foresters that the science is relatively mature and there are a range of tools, both for the field (ST300 or Hitman) and the mill (A grader) available to estimate MoE in standing trees, logs and sawn lumber. It is this author’s view that unlike the early expensive and destructive techniques for estimating PLI these non-destructive assessment tools, possibly along with remote sensing technologies will be the norm for future resource assessment and log segregation. The author understands that internationally when compared with slower grown softwood species radiata timber is (perhaps rightfully so) considered an inferior product. The pragmatist might say why try to be something you are not?

From a growers’ point of view whichever index is used must be able to segregate stems before logs are made. It is most likely that the best quality logs will be directed to produce high value products domestically whereas the fall-down grades will continue to be exported to commodity markets where performance is perhaps not so rigorously sought after.

The current radiata regimes favoured by southern growers are characterised by increased stocking and where sites and terrain permit, delayed final thinning. This approach results in restricting branch size, and minimising stem taper, both of which are linked with improved wood stiffness. While higher final crop stockings tend to derive some mutual protection of the crop from excessive swaying due to exposure to vigorous winds, these stands are vulnerable to damage from heavy falls of wet snow. Although not seen as a problem to date these smaller more slender logs also have a higher proportion of problematic core wood than larger logs grown under more radical thinning regimes. Reconciliations of stands, uncompromised by the ravages of wind and snow, grown on high altitude southern sites, show that those managed conservatively to final crop stockings greater than 500 stems/ha have merchantable volumes more than 40% greater than comparable lower stocked pruned stands managed on direct sawlog regimes. In these cases the small increase in price offered for pruned logs is more than offset by the increased volume of the higher stocked unpruned regimes.

Like others commercial growers Ernslaw supported a breeding programme which strived for increased vigour and as a consequence has paid the price with reduced internode length effectively wiping any flexibility to have a “dollar each way” option of being able to produce both structural grades and appearance grades via clear cuttings from our radiata crops.

Another Approach: change species!

In an attempt to reduce exposure to both the market and environmental risk of either backing an elusive upswing in the value of pruned logs or running the gauntlet of maintaining high final crop stockings in a snow and wind prone climate Ernslaw One have adopted a third strategy that of planting another species. Douglas-fir is now the dominant species on the Ernslaw One Southern estate occupying 68% of the stocked area. For a large corporate forester with a geographically diverse estate having more than one species to choose from provides a useful hedge against varying demand in the market place. Should the market for one species be down, the other may find better acceptance and all the more so if it is as widely traded and sought after as Douglas-fir is in international markets. In addition when managing a large estate for carbon as well as solid wood having a long lived species capable of carrying high basal area does provide a comforting insurance factor by allowing the smoothing of carbon fluxes at the estate level.

The same drivers of mean annual temperature, influenced by altitude and latitude, affect the stiffness of Douglas-fir just as they do with radiata. However, Douglas-fir is inherently stiffer, stronger and more durable than pine so starts from a higher base. Douglas-fir also has the advantage of a reputation for a much flatter gradient of wood properties from pith to bark. Put simply, it doesn’t have the same “core wood” problem of its radiata cohabiter. To the Douglas-fir grower’s advantage, logs of smaller size
can be adequately utilised in solid wood applications. Depending on site, Douglas-fir is managed on one of three unpruned structural log regimes. All three are designed to yield a high recovery of small branched (less than 3cm BIX) saw logs with a high proportion of MGP8 and greater lumber. Although MGP 10 and greater grades can be produced from southern grown Douglas-fir, this is only achievable on the better sites and will require significant improvement in the population genetics to generally provide these sought after grades.

The matching of genetics, site and silviculture begins with selecting the appropriate provenance for the site. Cooler more exposed and high altitude sites are planted with more northerly sourced provenances more suited to a shorter growing season. In contrast low altitude, warmer and more sheltered sites, are planted with faster growing provenances of Californian origin. Ernslaw One has invested heavily in a Douglas-fir breeding and seed production programme by establishing our own seed orchard. Where possible, first generation seed orchard material is planted in preference to that grown from seed stand collections. These genotypes have been selected not only on the basis of vigour and form but equally for their phenotypic wood properties favouring high wood density and standing tree outerwood acoustic velocity (Figure 4).

Pruned radiata logs are subject to a steep price gradient in proportion to the width of clearwood sheath. This premium dictates that piece size is of critical importance and hence affects early management decisions in the life of the crop. Structural grades are far less focused on piece size, no more so than with Douglas-fir to the point that there is a very flat gradient in price from logs as small as 140mm SED through to those over 400mm. Therefore regimes yielding a high recovery of small diameter logs, so long as they exceed the minimum threshold, return more favourable stumpages then those with less recoverable volume.

Analysis of inventory data from three conservatively managed Douglas-fir stands at age 50 with one repeatedly thinned from an early age revealed that while early thinning affected final volume equally not thinning reduced both total and recoverable volume Table 1.

These data illustrate the need to concentrate the basal area on good form crop trees but equally shows that regimes favouring large logs at the expense of volume/ha do not necessarily win out in the current market scenario.

Consequently Ernslaw One favour regimes with:

a) For stands where form or terrain does not permit production thinning, a single light and early thinning to waste;

b) Where terrain and stem quality permit the recovery of reasonable proportion of small saw log material, a regime characterised by later multiple production thinnings is practised;

c) The third option is for those situations where neither a) or b) apply, whereby untended regimes are grown primarily for carbon sequestration.

A future where New Zealand grown timber is remanufactured into high stiffness and strength panels and beams being used to construct residential or light commercial structures throughout the Pacific rim is not an impossible dream. We have the potential resource.

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Table 1: A comparison of four Douglas-fir regimes based on age 50 Pre-harvest Inventory

Figure 4: Acoustic velocity of selected ramets used in the Ernslaw One Douglas fir breeding programme.