

# Weighing up the benefits of silviculture and tree breeding on wood quality and prices

John Purey-Cust

I read our Editor's musings and the subsequent articles on the impact of silviculture on wood quality (51/3) with interest and some confusion. A large part of the latter reflects of course both my age and understanding of the technologies discussed - I am interested to learn that so much may be found out about wood strength and structure by the use of these techniques, but my own knowledge is such that I must either accept or reject it. Given the source, I accept it.

The question that then has to be asked, because both the title of the feature and comment in Euan Mason's editorial raise the subject, is 'but what relationship does all this bear to silviculture?' It looks to me very much more related to tree breeding. That does not belittle its importance, it just places the exercise somewhere else than silviculture in the continuum of forest management decision making.

As I understand it, silviculture is the technique adopted to reduce risk and preserve options where the end use of the harvest is too far off in time to be seen with certainty. A farmer may choose to grow barley, to be harvested in six months time, in the knowledge that he will be able to sell it either to the brewer, the baker, or for animal feed. He knows the markets that are there, the qualities required for each use, and the price range he is likely to get. Indeed he may even be able to negotiate a contract price before he puts seed in the ground. He works to known parameters.

But a forester can't do that. Quite possibly he plants on spec and will then have to decide what he must do to preserve his options in a world where, by the time he sells, uses may have changed greatly from what they were then. The two ends of the spectrum are quite simple - do nothing to the crop in the belief that technology in processing will take care of the problem, or do quite a lot, such as pruning and thinning, so that when the time to sell comes, what is offered will be of interest to everybody, and the only variable will be price.

To illustrate this further: I was once a shareholder in a 100 ha radiata plantation. It was on good country, handy to a range of markets and we pruned all, thinned half (the post market collapsed and we ran out of money), and sold the trees standing for a unit price per tonne at age 27 to 30 years.

If the plantation had been sold for industrial wood alone we would have got less than \$5/tonne. For the pruned but unthinned half we got \$40/tonne, but sold 850 tonnes/ha - \$34,000/ha. For the pruned and thinned part we got \$80/tonne and sold 550 tonnes/ha - \$44,000/ha. If we had stuck to our silvicultural knitting we might have got \$10,000/ha more from 50ha, or +13% overall.

In our case, when we started we took no advantage of technology at all; we used routine seedlings - tree breeding was still in the womb - and the bright future for radiata was seen to be either export logs or industrial feedstock. When we sold, the export log market had withered away under pressure from local processing, and the local mills

had accepted that for Southland radiata pine, colour rather than strength was the prime marketing virtue. The only industrial wood demand was an MDF plant mostly living on wood that otherwise would have been left in the forest.

If I were to repeat the exercise now I would do much the same, only ensuring that I did stick to my knitting and complete the job on time. No doubt I would go for genetically improved planting stock so long as I could be sure that in the process I did not lose the local advantage of good wood colour. Greater strength would certainly open up other options, but there too I would need to be sure that a proven value did not disappear in the pursuit of the theoretical. What works in nutrient-free Nelson and wind-swept Canterbury may not suit the South.

So, important as it is, I am afraid I don't see knowledge of tree structure as silviculture. It offers opportunities for broadening the options by breeding, but we still have to define how best to manage the forest. That is silviculture.

There is another bone to be picked in the editorial, and that lies in Euan's statement that 'All good silviculturalists know that long rotations come at a large cost...'. That depends on your starting point. If you are working on a stand or individual tree basis, with conversion to dairy or subdivision into lifestyle blocks an option, that may be true. But the business of forestry has a difference that valuers have always been reluctant to recognise, and that is the value of the option of permanence, or sustainability.

Currently a sustained yield forest of radiata pine grown on a 35 year rotation will produce more wood per hectare per annum and of a higher unit value, than will one grown on a 25 year rotation. If the forest has been there for a reasonable length of time, and many New Zealand radiata pine forests have been in existence for three or four rotations, then it seems reasonable to sacrifice the additional compounded costs of the first rotation for the sake of future continuing benefit.

The same principle applies to all species, and all that the bean counter's advocacy of short rotations brings is the sacrifice of both volume and value and the risk of consigning the crop to a price taking commodity status. But I have been told that such advocacy does have a value - by use of its methodology the forester can see what options are likely to be missing, and tailor his own silviculture to provide logs with those values in a time of shortage, and so hopefully reap a premium price.

On the other side we have the recent contrary example of a forest owner who took the bean counter path, produced a product which couldn't meet certified specifications, was fined \$900,000 and essentially has gone out of business. I don't call that preserving your options or good silviculture, even if it does make some kind of theoretical economic sense.

*Editor's reply: Silviculture can profoundly affect wood properties (e.g.: Lasserre et al., August 2004). Look for more on this in future issues. Also, in an "estate style" project valuation, longer rotations still come at a cost.*