of land that contains a 25-year-old pine plantation (20 ha).

Option A: The farmer sells 10,000 m^3 of wood for $500,000 and puts this in a bank at 7% interest. After 10 years, the investment would be worth $983,575 (2008 dollars).

Option B: The farmer accepts a "delayed-harvest" contract from a sawmill. The sawmill provides an annual payment to the farmer of $20,000/year for 10 years. In 2008, the farmer sells 35-year-old wood to the sawmill for $70/$m^3$ (a predetermined contract price). If the stand produced 14,000 m^3, the farmer would get a cheque for $980,000 at harvest. At a 7% interest, the 10 annual payments of $20,000/year would be worth $295,672 for a total of $1,275,672 (2008 dollars).

Option C: The farmer turns down all offers and lets the stand age for another decade. In 2008, the farmer sells the 35-year-old wood to the highest bidder. If the stand contains 14,000 m^3 and if the wood sold for $100/$m^3$, the farmer MIGHT receive $1,400,000 (2008 dollars).

Most will agree that money in the bank has less risk than guessing about future wood prices. Therefore a farmer that is risk adverse might choose Option A. On the other hand, a tree farmer who is a risk taker may choose Option C. Risking everything for 10 years MIGHT be worth an additional $417,000 (2008 dollars). Some individuals might gamble that by 2008 the "wall of wood" will not have driven down the real price of export logs.

A risk adverse farmer might also see Option B as attractive. In this case, some of the risk associated with a longer rotation would be shifted from the grower to the sawmill owner. For example, if the plantation burned just before harvest, the sawmill would lose $295,672 and the landowner would lose $980,000. Although the sawmill would be taking some risk, it would potentially be gaining a supply of higher-quality wood at a discounted price.

Even though it appears to be a good deal for the sawmill, I doubt many sawmill owners would he willing to make offers similar to Option B. I expect most sawmill owners are risk adverse. I doubt they would be willing to take a gamble on a long-term investment in improving wood quality. However, if sawmill owners were willing to shoulder some of the risks associated with growing trees, perhaps more landowners would be willing to consider longer rotations.

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The timing factor

Sir,

I agree with what Piers Maclaren (1997) has to say until he gets to the sustained-yield situation, the assessment of risks and the application of costs.

Using the same figures as the author, consider first the situation of a sustained-yield forest. Regime "A" has an MAI of 17m^3/ha/yr and Regime "B" an MAI of 24m^3/ha/yr. In a 20-year rotation on Regime "A" where there is one hectare of each age class, 1 - 20 years, the standing volume is 3570* m^3 and the harvestable yield of the one 20-year-old hectare is 340 m^3. In a forest of 35-year rotation [Regime "B"] that also has one hectare of each age class, 1 - 35 years, the standing volume 15120* m^3 and the harvestable volume of the one 35-year-old hectare is 840 m^3. Here one forest is 20 ha. And the other 35 ha. To bring the latter down to a 20 hectares each age class must only be 0.57 ha. The standing volume is then 8640 m^3 and the harvestable volume is 478.8 m^3.

The standing value of Reg. "A" forest of 200 ha is 3570 times the average m^3 value of the wood and that of the Reg. "B" is 8640 times the average m^3 of the wood, and the value of the annual harvest is similarly 340 and 478.8 m^3 each by the average m^3 value of their respective wood qualities. These are the comparative values of sustained-yield forest of these different ages.

To consider the cost factors, allow that each forest is grown on the same land. This eliminates any difference in land values. Annual harvesting and transport costs should be calculated on a m^3 basis and not on an area basis because, for this exercise, they are done on the same hectare. The cost of establishment and pruning may be higher for Reg. "B" on a per hectare basis, but only 0.57 ha needs to be established each year against one hectare for the Reg. "A" areas. Annual maintenance costs will be the same for each forest. These are the factors to be considered when applying the timing factor.

Next let us consider the risk factors. Using his example of three 20-year rotations versus one 60-year rotation, consider the physical and biological risks. His assessment of the latter rotation being three times greater is not correct.

Firstly, stands are at greater risk in their first 20 years than in the 21-60 year ages. For instance, young trees are more susceptible to fungal diseases and insect attack and there have been notable examples of this with *Dothistroma* and *Sirex* in our forests.

Secondly, when it comes to fire and wind damage there is little chance of any salvage in the young stands but many stands over 20 have been successfully salvaged.

In the sustained-yield situation one must look at the objects of management and the obligations that the forest manager has to supply wood on a continuous basis. Many large forests are grown to supply wood to utilisation plants. These need wood, not money, to feed them. There is often as much invested in these plants as in the forest and they need a **continuous** supply of wood. In these situations the risks of being dependent on only 20-year forests is unacceptable.

The small investor can get some comfort from insurance but this does not help when there is a utilisation plant to feed. He will only be interested in getting the best return irrespective of the quality of the wood that he sells. Unless the utilisers are prepared to pay a premium for the quality that they want, the grower cannot be blamed for the quality of the end product. However there is more to this, if the finished product is of poor quality then the industry as a whole will get a bad reputation, and this will reflect back into the stumpages that the grower gets.

Some countries have restrictions aimed at quality control, be it by age or size of the trees that can be harvested. The industry as a whole should be guarding the good name of New Zealand *P. radiata*.

Market forces only apply to the harvested product. Foresters unfortunately, have to make the crucial decisions at the start of the rotation; therefore faith and farsightedness are essential characteristics of the profession. Fortunately these have been strong in our past leaders. Foresters need the help of economists, but as Maclaren states, they must rethink their ideas when it comes to forests. We must get the logic and the data right, then let the chips fall where they may.

J.E. Henry

Reference: Maclaren P. 1997. The importance of wood quality. NZ Forestry, Nov, p3, 4.

** These standing volumes overstate an actual position but are indicative of the relative position.*

Alternative management regimes and straw men

Piers Maclaren's article (*The importance of wood quality* — November 1997) begins by comparing the mill door radiata prices with higher prices for other species (coal and diamonds) and proceeds