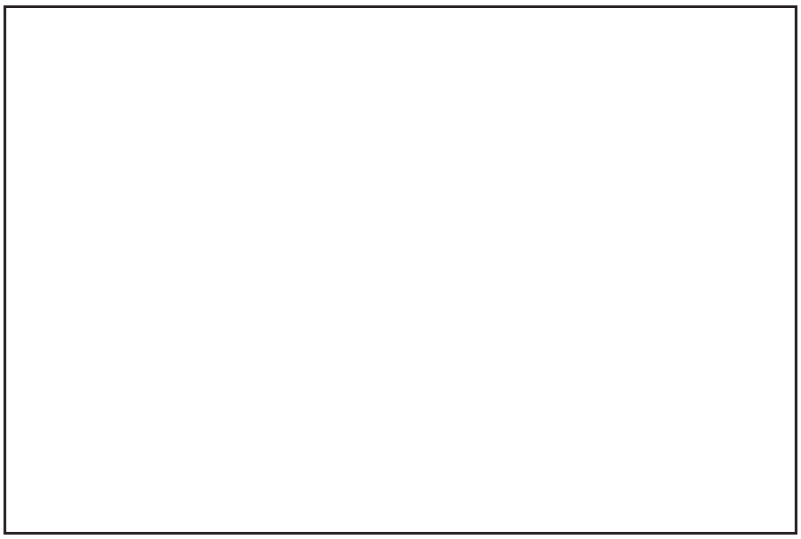
Pete's story

10

Of using, abusing and then ignoring the economics



The old pines on the hill are ours. The young plantations belong to other members of the Otway Agroforestry Network.

Sue and I bought our small property in 1999. What sold us on the block were the views, proximity to the city and beach, the surrounding community and a fantastic place to bring up a family.

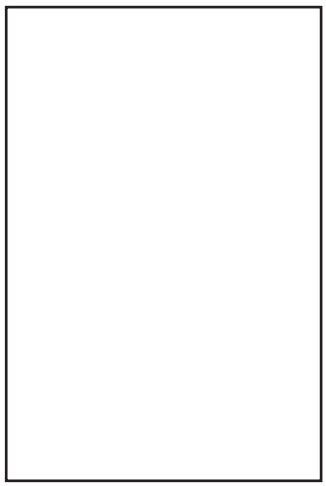
The 90acre property also had a reasonably well managed, 15acre, 30-35 year old pine plantation on it. The trees were of reasonably good form with small branching. Being a farm forester, this was of real interest to me.

After much too-ing and fro-ing (and some serious measurements and marker analysis), I decided that we should thin the plantation from 600 stems per hectare (basal area of 48m^2/ha) down to 300 stems per hectare (a basal area of 27m^2/ha), in effect removing 190m^3/ha or 935m^3 of timber in total from over 5 hectares.

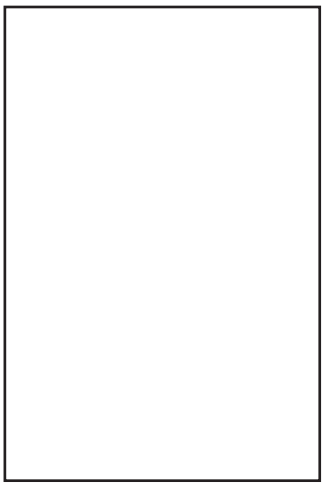
To help make this decision, I used the standard economic tool in considering any long-term project, a discounted cash flow analysis, and concluded that thinning now and letting the stand grow on for another seven years was a profitable option (see Table 1).

Some of the assumptions made in the analysis were:

- That we could sell green sawn timber into the Colac and Geelong markets (both 40 to 50 km from the farm) for a stumpage to me of \$5/m^3 . This wasbased on allowing \$100/m^3 of sawn timber for the cost



Inside the plantation. The debris from the first thinning done by the previous owner are still evident.



Peter measuring basal area using his MTG Tape

of milling on site with a 50% recovery, $20/m^3$ for harvesting, snigging and docking of round logs (or a cost of $40/m^3$ of sawn timber) $5/m for transport and a 'mill-door' price in Geelong of $150/m^3$. For 5 hectares, a total of $9,500 was estimated. Not too bad for a thinning.

- Fertilising the site after thinning was to ensure the remaining crop trees grew at 10 to $15m^2$/ha over the seven years to a basal area of approximately $40m^2$/ha and therefore a volume of $380m^3$/ha. The potential return in 7 years was estimated at $25/m^3$ or $7,500/ha.
- To protect against wind and fire damage, insurance was to be taken out at $150/ha.
- A discount rate of 6.45% was used to discount all future sums of money back to a present day figure. The discount rate of 6.45% was set as my opportunity cost of money, that being the mortgage rate on the loan for the property. For this project to be viable, it had to at least cover the cost of the loan and hopefully a little more.

Table 1: Discounted Cash Flow calculations for thinning and harvesting of the stand ($/ha)

Year	0	1	2	3	4	5	6	7
Fertiliser	-$500							
Insurance	-$150	-$150	-$150	-$150	-$150	-$150	-$150	-$150
Timber Returns	$950							$7500
Cash Flow	$300	-$150	-$150	-$150	-$150	-$150	-$150	$7350
Discount Factor @ 6.45%	6.45%	1	0.9394	0.8825	0.8290	0.7788	0.7316	0.6873
Discounted Cash Flow	$300	-$141	-$132	-$124	-$117	-$110	-$103	$4750

Net Present Value (NPV) ($/ha) @ 6.45% = $4,318.

Year 0 = The 1999/2000 financial year

The discount factor and therefore discounted cash flow is calculated as:

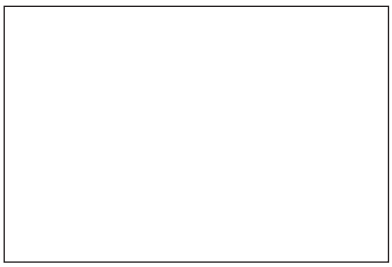
Discounted Cash Flow = Cash Flow x (1 / [1 + r]n) where r = discount rate and n = year

The decision to thin now and harvest in 8 years seemed to be economically sensible and also provided us with other non-tangible benefits, such as continued recharge control (the pines are situated on a sandy, permeable hill top) the continuation of a 'tree' business and a pleasant landscape.

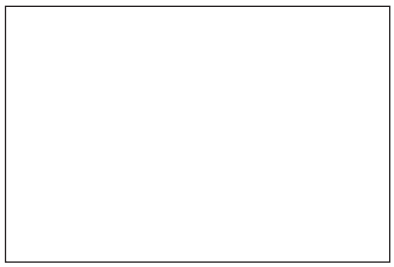
If only it was that easy!

We started thinning in January 2000. I had contracted a portable miller to saw the timber. The deal was that I would be paid $66.37/m^3$ of sawn timber (the mill was a wood-mizer and the miller was excellent; efficient, dedicated and knowledgeable). It was my cost to harvest, de-limb, snig and cut to length and deliver to the portable mill (50 metres from the edge of the plantation) and the miller's job to saw, pack, transport and market the timber. Again this didn't sound too bad, assuming a 50% recovery (or $33/m^3$ in the round) and about $15-$20/m^3$ to harvest, de-limb, snig and cut to length, my economic calculations would still be on track. Soon the wood-mizer portable mill was in place and markets were being found.

I do not have the skills nor the confidence to fell the trees, so two harvesters were contacted to fell the timber. I had previously marked all trees to fell and the fellers were paid $25/hour plus their variable costs such as chain oil, fuel and chain. The snigging or pulling of logs from the forest was to be done using a standard 50 horsepower farm tractor, a snig chain and a



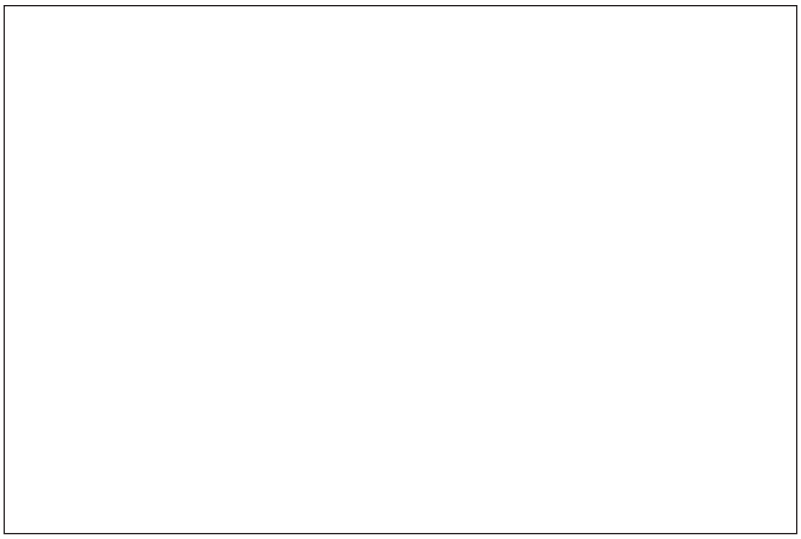
Josquin Tibbets felling the pine.



The farm tractor used to snig the logs out to the mill.

lot of 'grunt'. I was to manage this operation, but also employed a young bloke (at $10/hour) to help with the 'grunt' work. It was also my job to de-limb in the forest and dock the logs to length and place them in front of the portable mill. All seemed to be in place for a smooth and safe operation.

BUT, the cost of the job quickly blew out before any returns from the timber came in. Cash flow during the operation was always problematic. This was compounded by the difficulty of finding steady markets for the green sawn timber that we were producing. Those buying the timber always required a sample pack to be sent to their specifications. This was fine and product would be cut to their specifications, but buyers seem to come and go quite regularly early on in the process and quite often product would be cut for a buyer that then did not buy or the costs of getting the product to them turned out to be too expensive.



The milling operation underway.

Eventually a buyer, Southern Forest Products in Geelong (approximately 50km from the farm) was happy with our product and bought slabbed 100mm by 2.8m (oversized) material. The slabs were then re-sawn by the buyer for house framing. Even though the price paid for the finished product was the lowest of all buyers we had met with, the reduced labour and costs in only slabbing the material meant actual returns to the miller were the highest. Table 2 provides specifications and costs for 2 markets we cut for.

Once a genuine and committed buyer was found, the milling went reasonably well. However, the small size of the logs being put over the band saw (the average tree diameter at breast height for the thinned material was

TABLE 2. MARKET SPECIFICATIONS AND COSTS FOR TWO BUYERS OF OUR TIMBER.

	CCA - Worri Yallock	Southern Forest Products - Geelong
Product	150mm x 75 mm	100mm x 40mm x 2.7m (4 x 2 inch)
What we cut	155mm x 81mm (oversized 6 x 3 inch) to allow 10% for waste from re-sawing, but paid for 150x75.	Slabbed 100mm, 2.8m flitches
Selling price	$200/sawn m^3 at CCA's mill door	$165/sawn m^3 at the farm gate
Less cartage	$27.60	Nil
Less loading	$6.50	$6.50
Less royalty	$66.37	$66.37
Less mill labour	$80.00	$48.00
Less fuel/strapping	$12	$12
Total variable costs	$192.47	$132.87
Surplus contribution to overheads for the miller*	$7.53	$32.13
Production potential/day **	1.5 m^3 finished	2.5 - 3.0 m^3 slabbed

* overheads include lease costs, accommodation, blade sharpening and replacement, travel and repairs.
** assuming 7 machine hours per day.

only 28cm) meant recovery dropped from the expected 50% down to about 40-45%. I will discuss the impact of this small drop later, suffice to say it had a dramatic impact.

Costs soon began to blow out on the thinning front as well. The cost structure for the thinning operations is included in Table 3. The table shows the main operational costs, but not the only ones. The tractor did over 150 tractor hours which was a hire cost of over $1000 or $6.50/$m^3$. Over $1000 was spent on a roading at $4.30/$m^3$ and over $2,000 was spent on purchase of a chainsaw and other essential equipment (first aid kit, hardhats etc). Fuel and tractor repairs were a further $10.15/$m^3$.

TABLE 3. THINNING COSTS FOR 2.5 HECTARES

Operation	Time	Comment	Costs/m^3 of round timber
Felling	109 hours of paid contract work	Approximately 15 minutes to clear a safe area and line up the tree, fell and then move onto the next tree.	$10/$m^3$
Delimbing	100 hours of my time (not costed)	Approximately 12 minutes to de-limb all branches and dock the crown at about 10 small end diameter. Other costs included safety equipment and I had to buy a chainsaw for this operation	$3.60/$m^3$
Snigging	200 hours of which 100 were paid for	The 90 horse power, 4 wheel drive tractor was ideal in size, but breakdowns were costly. This was by far the most time consuming and dangerous operation	$3.80/$m^3$
Log making	130 hours of which 95 were paid for	Log making was docking logs into 2.8 m lengths	$5.45/$m^3$
Site clearing	46 hours of which 42 were paid for	The site had to remain clean for safe and efficient working conditions	$2.50/$m^3$

It was therefore costing me $46.30 /$m^3$ to harvest, de-limb, snig, dock and deliver the logs to the portable mill. But what I was actually being paid, all hinged on the recovery rates coming off the bandsaw.

If recovery was 56%, as originally discussed with the miller, my stumpage could be considered $37/m^3$ and therefore I was losing only $8.80/m^3$ of sawn timber. However, if the recovery dropped to 45% and perhaps even 40%, my effective stumpage dropped to $30/m^3$ or $26.50/m^3$ respectively which meant losses of $16/m^3$ or $20/m^3$. Recovery rate is very important, even for a portable mill.

Another issue that quickly caught me out was wastage. I estimated that approximately 10% of timber was left in the plantation (ie bends, losses, damaged logs) while another 40% was probably lost when docked for milling or rejected on the mill due to kinks, small diameter or butt sweep. Combining this with a 45% sawn recovery meant that the $40m^3$ of sawn timber that was sold required approximately $130m^3$ of round timber. From the $40m^3$ of sawn timber, I received $2,564 at a cost of about $10,000 - a loss of almost $7,500 over 2.5 hectares. It would have only cost me $1,300 to leave the fallen logs in the forest.

The main lessons from the operation:

- **Recovery and wastage.** A lot of timber should never have been snigged from the plantation, as the return from processing small logs (less than 20cm small end diameter) was never going to recoup the labour costs involved in harvesting and processing.
- **Labour costs.** Harvesting, processing and milling timber is a dangerous, difficult, and physically demanding job, particularly with limited farm machinery. Skilled labour was required, however far too much timber was put on the ground too early and as such, I was always 'chasing my tail' trying to recover high and early labour costs.
- **Machinery costs.** A farm tractor may be useful for snigging half a dozen logs from a wide spaced plantation, but it has limitations when working in a tightly stocked plantation. Anything that could get smashed did; the knocking off of tyre valves was particularly annoying. Poorly constructed log forks also got a belting and needed re-welding when logs were loaded unevenly. When I start thinning again, I will try and avoid taking a tractor into a plantation and investigate using winches, but again safety will be an issue.

Another tyre change.

The revised economic projections

Six months into the operation, I had run out of money, energy and our markets had vanished (I will come to that later). $40m^3$ of sawn timber had been sold, and while all fallen trees had been snigged from the plantation (so far only 2.5 hectares had been thinned) and docked to 2.8 metres, there was still plenty of logs still to be sawn and blue stain had 'run' through the stack.

A halt was called and instead of projecting a profit for the thinning, we had made quite a dramatic loss. We still have not fertilized and probably won't, opting to try and grow a leguminous crop under the opened stand (a small 'guesstimate' is included to cover this cost in Table 4). I don't think we will insure again as wind throw has not been a problem and we will be living on the property and will (hopefully) manage fire better than an absentee landholder would. So what has happened to our economic outlook? Table 4 presents the, surprisingly, still positive results.

TABLE 4: REVISED DISCOUNTED CASH FLOW ($/HA).

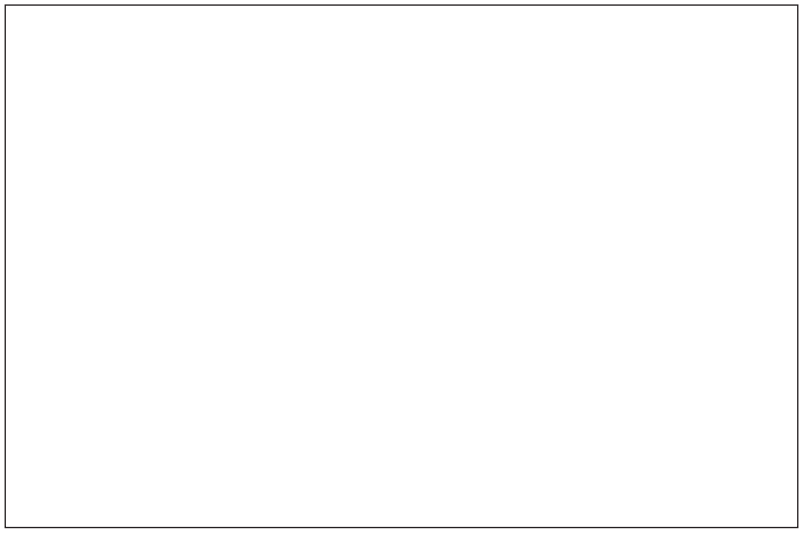
Year	0	1	2	3	4	5	6	7	8	9
Fertiliser			-$100							
Insurance	-$150	-$150								
Timber Returns	-$3295									$7500
Cash Flow	-$3445	-$150	-$100	$0	$0	$0	$0	$0	$0	$7500
Discount Factor @ 0.6456	1	0.9394	0.8825	0.8290	0.7788	0.7316	0.6873	0.6456	0.6065	0.5698
Discounted Cash Flow	-$3445	-$141	-$88	$0	$0	$0	$0	$0	$0	$4750

Net Present Value (NPV) ($/ha) @ 6.45% = $559

Internal Rate of Return (IRR) (per annum %) = 8.3%

The market and what is left

Prior to the introduction of the Goods and Services Tax (GST), the building market was booming, pine was in short supply and we could easily sell our small quantities (15-25m^3 at a time) into this market. We were always going to be price takers due to the product we were sawing; small diameter, knotty logs that competes directly with the huge supply from the industrial plantations; but at least we could sell. As soon as the GST was introduced, the building market slowed and we lost our buyers overnight. There was no way a small, private grower with the product we had, was able to sell into a depressed pine market.



After thinning the reduced competition should allow for rapid diameter growth on the retained trees.

I was therefore left with approximately 40m^3 of round timber, all docked to 2.8m lengths, on skids in front of a portable mill in my paddock. Luckily I needed timber to build a shed and so in January 2001, the 40m^3 was sawn and converted into 17m^3 of sawn timber, stacked and has now been air-dried down to 16% moisture content on the farm.

IF I walked into Bunnings or any other timber retailer and bought this amount of timber to the specifications I had cut, it would cost me approximately $13,000 or approximately $760/$m^3$.

The question is how do I value this timber? I didn't cost my time in the milling of this timber (approximately 10 days), nor was there a charge for the mill. But this $13,000 is an important opportunity cost and even more so with a recent ruling by the Australian Tax Office on the deduction of non-commercial losses.

Taxation implications.

A recent ruling by the Australian Taxation Office on non-commercial losses (June 2000) states that a loss from a business activity may be claimed against other income if the business passes at least one of four tests.
The business must:

- Have assessable income from the activity of at least $20,000
- Have produced a profit in three out of the past five years
- Use real property or an interest in real property worth at least $500,000, on a continuing basis
- Use other assets worth at least $100,000, on a continuing basis

The Commissioner may exercise discretion if the business fails to pass any of these tests. For farm forestry, this is important, as one of the issues that the Commissioner will consider is if "you have just started your business activity and, because of the nature of the business, there is a lead time before a profit can be expected". (The above 'tests' are not used if you are involved with primary production and your assessable income, other than primary production is less than $40,000 for that year).

We plan to seek a private ruling from the Commissioner on our 'business'. We hope to demonstrate that a 'business' was bought with the property (at the time of buying the property, an independent forestry consultant valued the plantation at $40,000. This was agreed, between the vendor and ourselves, as the value of the plantation 'business' - this agreement also helped reduced the amount of stamp duty payable at the time of purchase).

TABLE 5: ECONOMIC FORECAST FOR OUR PLANTATION BUSINESS ($/HA)

Year	0	1	2	3	4	5	6	7	8	9
Fertiliser			-$100	-$100						
Insurance	-$150	-$150	-$150	-$150	-$150	-$150	-$150	-$150	-$150	-$150
Timber Costs	-$4379									
Timber Returns	$1085	$5200	$1,500							$7500
Cash Flow	-$3444	$5050	$1,250	-$250	-$150	-$150	-$150	-$150	-$150	$7350
Discount Factor @ 6.45%	1	0.9394	0.8825	0.829	0.7788	0.7316	0.6873	0.6456	0.6065	0.5698S
Discounted Cash Flow	-$3444	$4744	$1103	-$207	-$117	-$110	-$103	-$97	-$91	$4188
Net Present Value (NPV) ($/ha) = $5866										

We also hope to prove that we have conducted our activities in a business like manner and expect a substantial return from our business "in a time commensurate with the business" we are involved in.
We will also continue expanding our business with the planting of further farm forests around the property. These forests will however play a number of roles; they will continue to expand our primary production business as we are engaged in a 'forestry operation' (see Taxation ruling TR 95/6) but these new farm forests will also be based around land care operations, which again

have important tax incentives (see Income Tax Assessment Act 1997) as long as we prove we are engaged in primary production or a business on rural land.

Our economic forecasts used to illustrate the potential return from our 'primary production business' are presented in Table 5. They show that we still expect to generate a profit within a reasonable lead-time.

Assumptions:

- While the $13,000 ($5,200/ha) for the current air-dried timber on hand is not a cash return, it is still the opportunity cost of buying timber to construct a shed for this current (2000/01) financial year and therefore has been included in the economic analysis. All previous costs (-$4,300/ha) and returns ($1,000/ha) associated with the plantation were incurred last financial year.
- As only half of the plantation has been thinned, potentially another 60m^3 of sawn and air-dried material could be sold in the next financial year (2001/02). Based on past costs and returns a conservative figure of $1,500 has been estimated as a potential return from the thinning of the remaining plantation in 2001/02.
- Insurance has been included in the analysis to show that the 'business' is being managed on a professional and competent basis.

Where to now with the economics of our 'business'

From our thinning operation a number of issues came to light that you don't often read about in the farm forestry literature.

Firstly it is a dangerous, time consuming, physically demanding and difficult job. It needs skills and knowledge. Gaining these can be a time consuming and expensive and ultimately a direct cost to those involved. The costs involved in collecting and processing information, negotiating stumpages and timber specifications, setting up and sending trial packs of timber, experimenting and refining logging systems with farm machinery, discussing options and operations with contractors, are commonly ignored in farm forestry analyses, but these costs can greatly influence a landholder's decisions on how to manage their forest.

Secondly, the market for a commodity product such as knotty, framing grade material is unreliable, extremely price competitive and one that a small grower will always have difficulty selling into. The product is cheap and the margins extremely tight. I could have avoided this to some extent by further value-adding our product by kiln drying, stress grading and dressing and increasing the value of the product from $160/$m^3$ for green sawn material to $760/$m^3$ for dried and dressed material. BUT I would still have a marketing problem, a cash flow problem and an increased period of exposure to risk.

Finally, I now believe that the economics of timber production from unpruned pine have been largely over stated and bear little resemblance to what actually happens in the paddock. Most analyses have been conducted by those promoting timber growing and ignore fundamental issues like high transaction costs, poor market pricing signals and the limited market strength most farmers will be able to muster. Having said that, the economic considerations in this project were useful in considering the strengths and weaknesses of the project over a period of time.

For our plantation 'business' to be successful we need to produce large diameter, high value logs, presented to buyers in an easy to harvest forest.

The thinning operation will ensure that we are setting up our forest to produce these assets for future sales. But there is still much riding on my 'guesstimates' of the volume and value of the final crop at the time of the final harvest. I will still be up against the same issues of limited market options, extremely tight margins, high transaction costs and insecure cash flow.

But I am confident that by careful management of the trees over the coming years and at the final harvest, and with the market knowledge gained during the thinning operation, I will be able to present to buyers a valuable 'timber package' that will satisfy their objectives and ours.

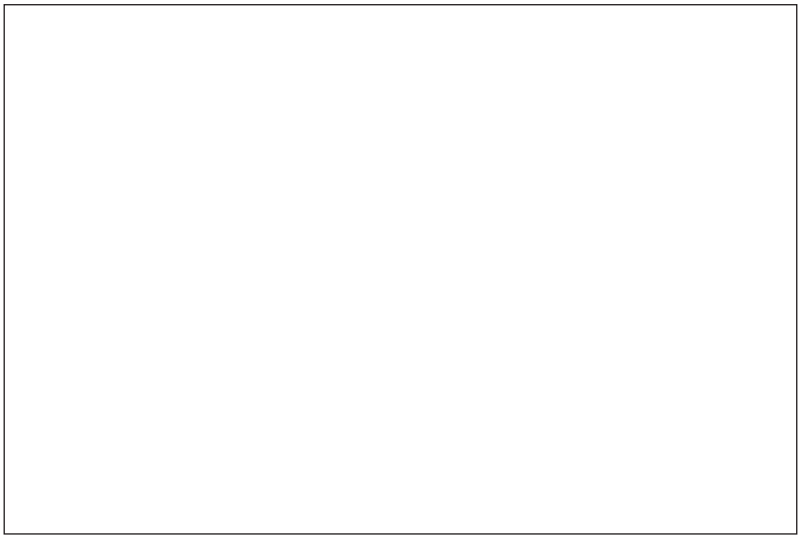
We bought our pine plantation as an on-going business and as such someone else's management influenced the design, the tree attributes and hence the economic potential of our plantation, that we are now trying to capitalize on.

Our future plantings will again have a commercial wood production component, but will be designed and managed to ensure that from planting, our trees will provide many other valuable services for us, be that erosion control, water management, biodiversity, wildlife, aesthetics and importantly for us, a sense of contributing to the bigger environmental picture. These issues are difficult, but not impossible to put a dollar value on them, but importantly the possibility of a return, financial and non-financial, from this diversity of services considerably reduces our exposure to risk if we were only interested in one service, timber.

From our experiences, farm foresters need to accurately and regularly measure and monitor their plantations, keep abreast of market information and make personal contacts within the market, build their knowledge and skills and continually reassess their options to make well-informed decisions concerning their forest.

Being a member of a strong regional agroforestry network, the Otway Agroforestry Network and the national private grower organization, Australian Forest Growers has helped build our confidence and linkages. The development of a regional marketing cooperative, SMARTimbers will no doubt help in more practical ways in the future.

We have a farm forestry business, now we just need to make it profitable.



A valuable experience and we still have the view.