

## Farmer Forestry – Liking the Time and Realising the Opportunity

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### Are You Still Here?

I was asked to speak on the title of 'Sustaining growers' enthusiasm for small-scale forestry'. "In particular", read the invitation, "we would like you to address the following questions", and I summarise: *Who are these small scale growers? How significant is their contribution? And, Will it ever amount to much?*

Taking it personally I couldn't help thinking that the real question was: *Isn't it about time you gave up on small-scale, integrated, family-farm forestry?* That's a fair question and one, I admit, has occurred to me before now.

In 2000, the national inventory identified 12% (67,000 ha) of Australia's total private plantation resource as being 'farm forestry' (Stephens 2001). If you added in the 180,000 ha of lease and joint venture forests you could easily argue, as we did, that the farm sector was significant and worthy of recognition. In 2006, the updated report didn't differentiate farm forestry but noted: *Many different tree species are being tried. The total area established is relatively small and individual lots are small and widely dispersed. These factors make it difficult to make farm forestry commercially viable* (Parsons et al. 2006 pp 7).

It's true. We all know that much of the so called 'independent farm forestry estate' is made up of small, poorly managed plantations, established with the help of generous government handouts, on land too steep or too far away from any market to be viable to harvest, let alone profitable. Whether based on plantation area, volume production, wood quality or industry sophistication, farmer investment in production forestry in Australia is small, economically questionable, dominated by enthusiasts, and more akin to a hobby than an industry.

So, why I am still here, why have I still got *time* for farmers and why does farm forestry matter?

### Having the time and liking to make a difference

In 1953, Jean Giono wrote an account of Elzeard Bouffier, a shepherd who set out each day to plant 100 acorns on the degraded hills around his solitary home. Giono describes how, as the trees grew, the wildlife, the water and later the people, returned to the once barren landscape. Elzeard also changed, at least in the way he farmed: he sold his sheep and took up bee keeping.

The forest administration thought the trees had regenerated naturally and sought to protect them from the peasants, including Elzeard. "The transformation

*took place so gradually that it became part of the pattern without causing any astonishment.... Who in the villages or in the administration could have dreamed of such perseverance in a magnificent generosity?* (Doyle 1993).

Many readers assumed it was real. That Giono had just recounted a chance meeting with a peasant in the hills of southern France and, when he returned after the war, found him living in a forest. In 1957, Giono wrote to the papers in frustration saying that he was "sorry to disappoint, but Elzéard Bouffier is a fictional person. The goal was to make trees likeable, or more specifically, make planting trees likeable" (Anon 2008). In believing the story they had missed the point.

The popularity of the fairy-tale suggests most people are well aware of value of forests. Even more, they are ready to believe that planting trees can repair the soil, restore biodiversity and ecological function, provide commercial products and support agriculture in a way that is in tune with the *pattern* of the land. Yet, because they would not consider investing their own time or money, they can't see any rational reason why others would do so: What *profit* would there be for them?

I'm not here to defend farm forestry by arguing that it is 'commercially viable' for farmers to grow forests for timber. Farmers own more than 70% of our landscape, yet, though much of their land needs trees, most has little prospect of ever being 'profitable' for plantation development. I'm here because farmers are possibly the only people in our community who have the *time*, and the *liking*, to grow quality forests where we need them most. I'm here because farmer participation in forestry is significant and it is making a difference - but not always for the reasons, and certainly not based on the measures, that foresters currently use to define value and quality.

### Plantations: Just Another Crop?

Government funded plantation development was once driven by motives of public good: regional employment, national security and timber self-sufficiency (Bankes 1998). There were private plantations but they were largely grown by processors, not investors. Growing trees was about nation building and resource security.

Then, Professor Ian Ferguson (1985) recommended the Victorian government aim for a 4% return on their pine plantations. This sent shockwaves through forest agencies across the nation. World peace, globalisation and the privatisation trend had eroded the influence of any public good arguments. The new, and clearly stated, motive underpinning the establishment of every hectare of plantation, both public and private, was profit.

German foresters from the 19<sup>th</sup> century are credited as being the first to develop the mathematical methods (Discounted Cash Flow Analysis, DCF) which have become the standard for assessing plantation profitability and their optimum rotation length (Viitala 2006). Along with the costs of land, planting stock and labour, an investment in tree growing carries with it a cost of waiting that can be calculated and discounted from the expect return.

This allows for a direct comparison of long term plantation options against the annual returns of agriculture (Trapnell and Lavery 1989, DNRE 2002). The measure is usually Net Present Value (NPV) but might also be Internal Rate of Return (IRR), Annuity or the Benefit Cost Ratio (B:C) (Malcolm et al. 2005). If growing timber can be shown to be more profitable than growing grass then it should be encouraged – or at least tolerated.

Since Learmonth and Rabbette (1978), there have been numerous studies that 'prove' forestry can be more profitable than agriculture (Ferguson and Reilly 1978, Gisz and Sar 1980, Garland et al. 1984, Malajcuk et al. 1984, Trapnell and Lavery 1989, Dyason and Lovell 1998, DNRE 2002 and many others). DCF analysis has even been used to produce 'plantation profitability maps' based on climate, soils, existing land vales and haulage distances (Burns et al. 1999, PNE 1999).

As the industry keep telling us: their timber plantations grown for profit are 'just another crop' for which there is an optimum species, management regime and harvest age (Jenkins 2004).

## Putting a Cost on Time

To undertake a Discounted Cash Flow analysis you need to choose a discount rate that reflects the cost of waiting. Whereas Ferguson (1985) proposed a real rate of return of at least 4% for government, most economists use higher rates for private plantation growers because they assume, justifiably, that individuals have a higher time preference for money (we want it now) and a greater exposure to risk: Eckersley (1993) used a rate of 7%, Moore (1996) 7%, Harrison and Herbohn (1996) 3-8 %, Dyason and Lovell (1998) 7%, Herbohn and Harrison (2000) 3-7%, DNRE (2002) 6-10%, URS (2003) 6 – 10% and Thompson and George (in press) 5%. The highest discount rates I have been able to find for plantation forestry are 11% (Malajcuk et al. 1996) and 12% (CoA 1991).

Figure 1 illustrates how the choice of discount rate impacts on the apparent profitability of a theoretical plantation of pine grown over a 25 years rotation (Thompson and George In press). Without any discounting the plantation returns a profit of \$12,000 per hectare. The authors used a discount rate of 5% which reduces this to just \$1221/ha. This implies that the cost of waiting twenty five years for the trees to grow is \$10,779!

The Internal Rate of Return (IRR) (the discount rate which results in a NPV of zero) is 6.4%. At higher rates the plantation would be deemed unprofitable – all the income would simply go to paying for the time. If a grazier was able to achieve an average net return of \$120/hectare/year it would not be worth converting their pasture to pines unless they could justify using a discount rate of less than about 4.5%.

I've been exploring the notion of an appropriate discount rate for farm forestry with our Master TreeGrower participants by gauging their feelings about risky long term investments. I ask them to nominate what they would be prepared to spend to purchase a fixed sum of cash pinned to the rafters of the hall. The catch is that the money would have to stay where it is for twenty years before they could take it home!

We then identify the risks: fire, unscrupulous cleaners, local government amalgamation, death ..... Once they give me a figure I can calculate their effective discount rate. Most have a personal discount rate for this type of investment of between 12 and 20%! To many farmers, an investment in growing timber is akin to making a large fixed-term cash deposit in a government bank of a small politically unstable island nation facing hyper inflation and inundation by rising sea levels! They are interested in being in the game but will only invest what they can afford to lose.

The longer the rotation, or the higher your personal discount rate, the greater will be the cost of time. We try to cheat time through genetic selection, targeting high quality plantation sites, intensive site preparation, heavy thinning, and the development of harvesting, processing and market options suited to small, fast-grown trees. Yet, despite our best efforts, time remains the greatest single cost associated with growing trees for timber – it will almost always be more than the cost of the land itself!

Not surprisingly, as discounting became the primary measure of determining plantation value, European interest in planting Oaks for timber largely evaporated. However, in Australia, high land and establishment costs can be justified if it means faster growth and shorter rotations. Economies of scale, yield per hectare and distance to market are critical. To be commercial, growers must establish large, monoculture plantations of rapidly growing species in high rainfall areas within close proximity of existing timber processors or export facilities (Turner et al. 2004). Long rotation forestry has been relegated to the annals of history. Expecting small scale, mixed species forests on marginal sites to be profitable is just irrational!

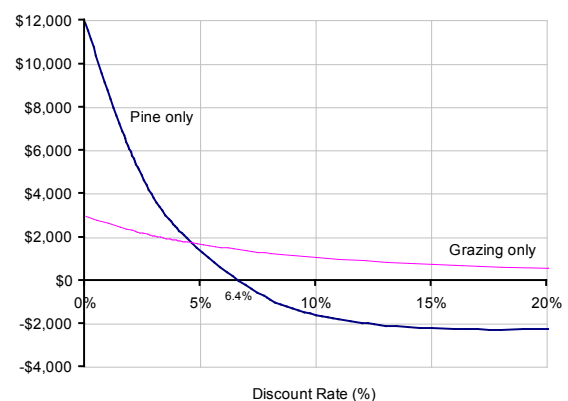


Figure 1. The impact that the choice of discount rate has on the expected profitability of a theoretical pine plantation (grown over 25 years for pulp, poles and sawlogs, as proposed by Thompson and George In press) and an existing grazing operation that returns a profit of \$120/ha/yr.

## What's to like in the Farm Forestry Game

I've learn a lot from the farmers I work with. Some, like David Jenkins, Andrew Stewart and Noel Passalaqua, started planting trees for timber about the same time as I did and have become good friends. Over the years each of them has helped me understand what it is we do and why we do it.

David Jenkins and I planted our first eucalypts for pruned sawlogs in 1987. We were both influenced by another West Australian, Richard Moore. David has since experience all the highs and lows of tree growing. A highlight, for me at least, was in 1999 when David joined us in Apollo Bay to hear Dr Jim Finley from the Pennsylvania give the final presentation of our Agroforestry Expo.

Whilst Jim doesn't know much about eucalypts, and I'm not sure he's pruned anything bigger than a Christmas tree, I'd brought him out to talk to farmers about something else: about what it means to *own* a forest. Jim spoke about how we, as tree growers, invest some of ourselves in our forests, write a history on the landscape with trees and leave a legacy for our children and the community.

When Jim finished David was the first to speak. With some emotion, he thanked Jim then said it was the first time in all his years as a tree grower he'd heard a forester touch on what he himself had always known: *farm forestry was more than growing wood for money and it was OK to be emotionally involved with your forest - to care.*

Andrew Stewart is a 4<sup>th</sup> generation farmer. How it came to be that I would buy a farm just over the hill still astonishes me. Andrew and I have since worked together on many farm forestry projects: we set up the Otway Agroforestry Network, ran the first Australian Master TreeGrower Program and, with others, developed the Peer Group Mentoring concept. We've spent hours, often over a red, trying to come terms with what it is we are doing and trying to understand why it seems to work.

It was when I was filming Andrew in the paddock that he said something about growing timber as an investment: *Long term rotations of up to 30 years don't really present a problem to me because, well really...I think there's an opportunity there because, whilst the trees are there improving the farm productivity and environmental integrity of the property they're growing into timber ... we're currently making our living from prime lambs and beef and the trees are assisting in that process so we have assured income, but the next generation, they'll gain the benefit of harvesting those trees then perpetuating the system by replanting.*

After showing me around their nursery and forests, Noel Passalaqua and I were filming from his favourite spot overlooking the farm. Noel turned to the camera and said: *Here is something that I never get sick of. You know, I've lived on this farm for 22 years and it just gets better and better, It gives us a great feeling every time we come up here. It's a beautiful landscape and it's improving every year. How do you value that? How do you quantify that? I guess, in simple terms this is the*

*place we live, this is our life. People try and design a good life in many different ways, and often it revolves around income. But, you know, improving the landscape value gives you a better feeling about where you live. It's not something that you can value with money, it's just a feeling. It's where you live, and if it improves your quality of life it's a great thing.*

As their forests have grown so has their confidence to talk freely about why they planted trees and what it means to be a tree grower. Of course it all takes time. But *time* is just something that passes while we live out our lives. *Time* is not just a cost, it is also an *opportunity*: An opportunity for us as to grow forests that not only give purpose and meaning to our own lives now but also provides the real prospect of generating a cash return and leaving a legacy.

In the summer of 2003/4 I got a call from David. His farm, and the whole valley, had been burnt by an intense wildfire. Whilst the home survived – protected in part by Oak trees – all their plantations were burnt and hundreds of sheep killed. Since then, it's fair to say that David's interest in trees and his enthusiasm for farm forestry has waxed and waned.

Whilst some trees survived, most notably the Spotted Gum, and he was able to generate income from the salvage harvest, there was much that was lost. Like a premature clear fell harvest, the fire had stripped the landscape of twenty years of growth. The money he received was never going to be sufficient compensation for the *time* he had lost.

The economists are right: the time it takes to grow timber is important. But, what they don't appreciate is that understanding time in forestry is not as simple as putting a dollar value on it. Despite the efforts of lawyers, what distinguishes forestry from other long term investments is that the trees are physically tied to the land. A mature forest is not like a piece of antique furniture or a vintage car – you cannot go out and buy one to replace the one you've lost. For a farmer to grow timber waiting is not just a cost, it is unavoidable. Time still needs to be lived. Rather than just being a source of income, forests are a capital asset, part of the farm's infrastructure.



Figure 2. The Tree Huggers, by John Jonik.  
<http://www.mindfully.org/Jonik/Tree-Huggers-Jonik.htm>

## Timber – Just Another Product of a Capital Value Forest

Martin Faustmann (the 'father of forest economics') once wrote that his optimal harvest model could be used to show that it would be more profitable for a farmer to clearcut his entire forest estate immediately rather than continue with "sustainable forestry practices" (Viitala 2006 pp 140). As he walked me into an old growth forest in Oregon, John Bliss (OSU) said if you want to buy a mature Douglas Fir log you'd need to visit a family forest owner - all the public old growth forests had been locked up and the industrial forests were clearcut as soon as they reach their optimum rotation age (Figure 2).

Their point, and mine, is that although important, profitability (as measured by a simple DCF analysis) should never be elevated to the status of the drafting gate for defining quality and legitimacy in forestry. Taken alone, financial analysis will favour species and management options that produce lower quality timber and provide fewer environmental and social benefits than we all know a forest can if it is purposely designed, well managed and grown for longer.

This conflict, between what we know is *Quality* and what is perceived as *Profitable*, is obvious to those outside forestry and only serves to undermine the attractiveness of our plantation options amongst the very farmers and communities we need to engage. Rather than fight against time, we must find and work with those who are willing to harness it as an opportunity.

With time on their side they would select species based on their wood quality, not just grow rates. They could justify growing timber on low quality sites or in low rainfall areas. They would grow the large logs that the mills need if they are to cut wide, clean quartersawn boards. Their long rotations would support greater biodiversity (Borsboom et al. 2002), use less water (Cornish and Vertessy 2001) and store more carbon (Specht and West 2003). If time was a friend, rather than a foe, there would no cost to waiting a little longer for something a lot better.

## A Forest Worth Planting, Owning and Harvesting

Whilst timber plantations can be shown to be profitable, the time involved and the inherent uncertainty mean that most farmers cannot justify the investment (White and Black 1999). It's a stalemate that has thwarted farm forestry development for decades and led to a succession of useless publications, demonstrations and subsidies aimed at trying to entice farmers to commit to what, for them, is essentially an 'ugly' investment.

*The ugliness the farmers are fleeing is not inherent in forestry, it only seems that way to them because it's so hard for them to isolate what it is that makes plantations so ugly. But forestry is just the growing of trees and can't by its own nature be ugly or there would be no beauty in rainforests or gardens which also include growing trees. The real ugliness of plantation forestry lies in the relationship between the foresters and the forests they develop.* (Paraphrasing Pirsig (1974) Zen and the Art of Motorcycle Maintenance Chapter 25)

One part of that relationship that few foresters have ever questioned is how we interpret time and evaluate profitability. I believe we've got it wrong, particularly when it comes to understanding *farmers*. They simply don't like the way we do forestry. That doesn't mean they're not interested in growing trees or producing timber – of course they'd like to make more money from their land. The problem is that we've never seriously looked at what it would take to make planting trees and managing for timber likeable to farmers.

Like sunlight, time is a readily available resource that can help us grow quality forests that transform landscapes, enhance farming systems and build wealth. Time can also be cheap, particularly if the forests provide real rewards to the owners while they are growing. Rather than time increasing risk, a multipurpose forest can reduce the risks of time. Acknowledging this changes our notion of what is worth planting and where. Farmers plant trees because they want to *own* a forest – not a bank statement:

*I see using commercial trees and habitat trees as part of the risk management strategy for our property. We have trees integrated into the landscape for their multiple values, but if, at the end of the day for whatever reason the trees aren't harvested they're still performing jobs for the farm. The money we get from harvesting timber is a bonus. We prune and thin just so we can keep that opportunity alive.* (Andrew Stewart).

Pirsig's hippy classic from the 1970s explores the notion of quality as a marriage of the classic (technology and economics) with the romantic (aesthetics and emotion). What we need is a more sophisticated understanding of farm forestry economics that acknowledges that quality in forestry is more than an attractive NPV. We must recognise that, between the decision to plant and the decision to harvest, there is a forest that occupies part of someone's life and their landscape – the forest must be worth owning:

### Test 1: Is the forest worth establishing?

There is no question that most farms would benefit almost immediately from fencing out waterways, regenerating degraded areas and establishing a web of shelterbelts and forest blocks. Other benefits might include access to a favourable taxation status or simply the personal satisfaction of getting involved in a new and worthwhile enterprise. It doesn't need to be expensive, planting in any one year only what you can afford and manage is easy, cheap and fun.

### Test 2: Will the forest be worth owning?

Once established, the forest must continually justify its presence if it's to attract the ongoing investment required for maintenance and management. Benefits of owning a forest might include the stock shade and shelter, reduced land degradation, enjoyment and personal satisfaction, enhanced property value, or even new off-farm employment opportunities. If an owner perceives their forest as a threat or burden then they are unlikely to maintain the trees or their interest in any future income opportunities.

### Test 3: Will it be viable to harvest?

Irrespective of the rotation length the only thing that ultimately determines whether a forest produces timber is harvest viability. Harvesting is

only viable if the return from timber adequately covers both the cost of the operation and compensation for the loss other values, with enough left over (profit) to ensure a degree of satisfaction. Unless they are left satisfied farmers are unlikely to replant or manage their remaining forest with the view to harvesting again. There is no need for the harvest to pay for time if the forest was worth owning so growing high value species can be justified.

Whilst it is possible to provide grants and tax breaks to entice farmer to plant, it is the second test that makes forestry an attractive land use option. If silvicultural management (thinning and pruning) complements other values (biodiversity, fire protection, grazing, aesthetics etc) there is little cost in maintaining the option of a future harvest of high quality logs. Indeed, if a forest is worth owning, there is less pressure for a premature harvest. Age improves the prospects of a viable harvest as higher log values and yields offset the higher costs associated with small scale operations. Time also increases the likelihood of being able to survive a downturn, or target a spike, in the timber market.

In their review of real Australian case studies, including both Andrew's and Noel's farms, White and Black (1999), conclude: "*An interesting, but perhaps not surprising, trend in implementation of farm forestry is that in all case studies individuals have quickly adopted planting regimes that suit their specific needs and resources. This often involves planting small areas on a regular basis. None of the case study participants is disappointed with the outcome of their efforts, and in many cases the transformation of the properties is spectacular.*" (White and Black 1999 pp 125)

## Liking my time as a Forest Owner

My grandfather, a farmer himself but whom I never met, gave me the opportunity to plant a forest while I was still young enough to grow with it. I was a new forest science graduate, trained in conventional plantation management and evaluation. Yet, when it came to making a decision about what I wanted to grow I couldn't bring myself to plant the most profitable plantation option: which, at the time, was high stocked, unpruned pine. I chose to create my own forest, for timber, conservation, shelter and landscape aesthetics - *'100 acorns at a time'*,

I spend what I can afford to lose. What I grow, and how I manage it, reflects my changing interests, needs and aspirations. With each harvest I aim to improve the value, both commercially and environmentally, of what I leave behind. Rather than encourage other farmers to copy me, I simply want to show them how forestry can be much more rewarding than they might have ever imagined. How owning a forest can mean much more than investing in 'just another crop'.

For me, the only measures of success that really matter are how I feel about being a forest owner and how my family, particularly any unborn grandchildren, will view my work when I'm gone. Nonetheless, I did have cause to have the farm valued. Without including any amount for the standing timber the agent suggested that for every hectare of trees I had added around \$20,000 to the capital value of the farm. I then asked what would

have happened had I planted the whole farm to a 'profitable' pine or eucalypt plantation. "*Oh, I have some of those on my books. It would have been worth less than cleared land value!*"

Forestry on farms has come a long way in the last 20 years. There has been change that is 'in pattern' with the land and the community. It may not have had much impact on the National Plantation Inventory - it's more complicated than that. To really see the impact of farm forestry you need to spend time with farmers and see how silviculture is making owning a forest more *likeable* to them. It is now just be a matter of *time* before these forests produce quality timber and make real money.

To make money from our timber harvests we will need access to a vibrant and multifaceted timber industry that involves governments, industry and corporations. Farm forestry is not inherently better than any other form of forestry - but it is, I would argue, different. It is this difference that makes farm forestry such an important part of the Australian forest industry and worthy of recognition beyond the contribution its area, volume production or apparent profitability would suggest.

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