



## CHAPTER 12 - ECONOMIC ANALYSES



The lack of information on management costs and consistent stumpage values currently prevents accurate economic analyses of blackwood management in New Zealand.

However several New Zealand studies have been conducted:

- In general these have shown a likely IRR of 5 to 8%.
- In comparison with radiata pine, blackwood incurs higher silvicultural costs, and has lower productivity.

To justify planting on more than a small scale therefore, there will need to be a significant increase in returns from the present value.

- In a hill country study (see box next page) a comparison of probable returns showed that blackwood was:
  - less profitable than radiata pine
  - comparable to *E. fastigata*.
  - more profitable than sheep and beef farming.

## Land use evaluations

An assessment was made in 1985 which looked at the economics of growing blackwood based on interplanting. Under the assumptions made for a range of scenarios, blackwood performed better than other specialty timber species (cypresses, eucalypts and black walnut) with a range in IRR from 5.3 - 8.0 %, but was behind radiata pine.

Enrichment: In recent years another paper has also evaluated interplanting. This considered that “on suitable scrubland sites enrichment planting with cypresses (*lusitanica/macrocarpa*) and blackwood has conservation and potential employment advantages over conventional radiata pine plantation forestry”. This determined that based on domestic stumpage sale prices (in 1994) an IRR of 5 - 6% for blackwood compared with 11 - 14% and 11 - 12% for radiata pine and cypresses respectively. However, it was also commented, that if higher timber prices such as those achieved in the Sydney market were used, then blackwood returns were closer to the other species.

Hill Country: In the most recent published economic analysis, tree growth rates, economic returns and the effects of trees on pasture for radiata pine, blackwood and *E. fastigata* were analysed to assess the economic returns of using these tree species within a New Zealand hill country farming operation. Under the assumptions made, all three species options were more profitable in the long run than sheep and beef farming.

Radiata pine produced the greatest return, with large increases in log prices or yields of other tree species being required to give equal profit.

This study commented that compared with radiata pine, blackwood is extremely labour intensive. Each hectare of radiata pine cost \$1,805 including plant materials, herbicide, full contract labour and supervision. When the work was completed by on-farm labour 56 hours were required per hectare. This compares with \$1,924/ha and 53 hours for *E. fastigata*, and \$3,429/ha and 112.4 hours for blackwood.

## Problems with Economic Analyses

- Data from Australia may not be relevant to New Zealand. They are subject to marketplace distortions (trees are sourced from state-owned rather than private forests). The trees have different growth rates because of different site conditions and silvicultural management.
- The New Zealand marketplace is distorted by irregular and limited supply.

## Future Prospects

Blackwood milled in New Zealand from about 2015 is likely to be:

- of better quality – pruned, thinned, and of larger diameter.
- available in larger volumes. This should produce a regular supply, and introduce economies of scale.
- in increasing demand. Blackwood is suited as a substitute for native species (especially rimu), as well as for rainforest species.

## Current prices

- These have shown a significant recent increase.
- There is currently no price differential for colour in the New Zealand market. However, this may occur in the future.
- Log diameter is relatively more important than length.

On many properties where blackwood is grown it has been managed on a small scale as a hobby or sparetime activity. In these circumstances it incurs no or minimal silvicultural costs. However, on these properties later costs may be incurred from the extraction of small numbers of trees from inaccessible sites, and the marketing of small volumes of timber.



Over-stocked blackwood plantation aged 9 years.  
(Lardner, Victoria)

## Hill country forestry and farming analysis

The results show that all three agroforestry options produce higher long term returns than the current sheep and beef farm. Of the three, radiata pine produced the greatest return with *E. fastigata* giving higher returns than blackwood, on a whole farm basis although the per ha returns were similar (c.\$1100/ha/ year). *E. fastigata* had a higher IRR due to the shorter rotation length. *E. fastigata* prices, currently taken to be 10% below radiata pine would need to increase by 43% to give the same return. In contrast, blackwood prices assumed to be three times higher than radiata pine would need to double again to be competitive. Livestock gross margins would need to be \$76/su to give the same annual return at normality.

## Economic Base Case

The following is presented as a guide to expected costs of blackwood management and is indicative only. Detailed economic analyses using appropriate expertise should be undertaken before substantial investment in blackwood plantations is made.

**Table 8: General guide of expected costs and returns of blackwood plantation management for 35 year rotation.**

Operation	Age	\$/ha#
Seedlings (800)	0	450
Planting (800)	0	150
Fertilising	0	100
Releasing	1	120
Form prune	2	100
Gauge prune	3	125
Low prune (to 2m*-best 400 stems/ha) and gauge prune above lift	4	160
Gauge prune	5	200
Medium prune (to 4m*-best 400 stems/ha) and gauge prune above lift	6	300
Gauge prune	7	200
Thin to waste down to 400 stems/ha	7	150
High prune (to 6m*-best 200 stems/ha)	10	260
Thin to waste down to 200 stems/ha		200
<b>Total silvicultural costs</b>		<b>2,215</b>
Plantation overheads @ \$80/yr	0 - 35	2,880
Management costs @15% of costs	0 - 35	413
Revenue 300 m <sup>3</sup> /ha sawlogs from 550 m <sup>3</sup> /ha @\$220/m <sup>3</sup>	35	66,000
IRR, with no management fees and no overheads		10.5%
IRR, with overheads (\$80/yr)		9.6%
IRR, with management fees and overheads		7.5%

\*Variable lift, leaving 3 m green crown

#Approximate costs and revenues only.

## Key Points

- Economic analyses are difficult because of uncertain data.
- Blackwood economic evaluations have returned positive values, usually with IRR of 5-8%.
- In New Zealand, blackwood returns appear less than radiata pine.
- Silvicultural costs are difficult to determine.
- Recoverable yields are relatively unknown.
- Log sales have insufficient history to give consistent pricing.

## Suggested reading:

Cavanna and Glass 1985.

Herbert 1994.

MOF 1995.

Nicholas 1991.

Nielsen *et al.* 1990.

Thorrold, Knowles, Nicholas, Power  
and Carter 1997.

