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FORESTRY, A VALUABLE CROP FOR THE PASTORAL FARMER

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ABSTRACT

The integration of forestry into a pastoral system (sheep & beef cattle) will be discussed with respect to the economic sustainability of the system. The cash flow implications for a case study farm of forest development, and methods used through forestry right agreements to facilitate these by reducing risk, will be developed.

KEYWORDS

Cashflow, Internal Rate of Return, Sustainability, Forestry Rights, Risk Management

INTRODUCTION

There are a number of pastoral farms in the belt of sand country that runs up the west coast of the North Island, which have significant areas of the farm in woodlots, planted, in many instances, to control sand dune erosion. These woodlots are harvested at maturity and replanted. They have added useful revenue to these farms over the years to the extent that some farms would generate at least half of their gross revenue from timber. They are in the position now of having a sustainable forestry system within their pastoral farming system. They are in a significantly better financial position than their neighbours with no or limited woodlot areas and are able to maintain an economic unit with fewer hectares of land.

With current returns in the sheep and beef cattle sector, the possibility of establishing a similar scenario on a pastoral farm is limited. This paper examines the options that were available in 1993 to a case study farm on which there were existing immature woodlots and discusses the long term implications of methods available to achieve sustainable forest revenue streams within their farming system.

THE CASE STUDY FARM

The property is 1450 hectares of coastal sand country. The typical vegetation consists of rough pasture and lupin with improved pasture on the flats. Problem weeds in this area include gorse and boxthorn. The property is good wintering country and well suited for cattle but does not perform well in a dry summer.

The total assets, (land, buildings, plant and livestock) of the farming operation in 1993 were worth \$1.2m and the immature forest was valued at \$353,572.

The requirements for funds from the providers of capital was:

Debt Capital Cost	\$38,224	Interest pre-tax,	\$25,610 post-tax
Equity Capital Cost			\$30,000 post-tax
Weighted Average Cost of Capital (WACC)			\$55,610 post-tax

This equates to 4.6% of \$1.2m (excluding the trees) and 3.6% of \$1.55m (including the trees). In 1993 the WACC consumed 100% of the net operating profit after tax (NOPAT) generated from farming. When forecast forestry returns were included in future cashflows the Internal Rate of Return (IRR) on total assets of \$1.55m was predicted to be 8.5% pre-tax and 6.3% post-tax. This compares favourably with IRRs of 7.0% pre-tax and 4.8% post-tax from farming alone.

Existing forestry on the property included nineteen woodlots varying in age from one to eighteen years old. In 1993 the landowner had 7 years to wait before the first timber sales and 9 years before a

significant sale. The younger woodlots were all due for pruning and thinning in that time and the farm was generating no surplus from sheep and cattle farming with which to meet the projected costs. The forecast annual cashflows for the property are as illustrated in Figure 1. The farming business is forecast to continue to generate sufficient funds to meet the cost of capital but insufficient funds to meet forestry costs. There are annual deficits forecast until the harvest in the year 2002; these deficits accumulate with interest to \$103,000.

SCENARIO ANALYSIS

The base model for the scenario analysis is the farm making no change and, as each woodlot is harvested, replanting that area. The aim is to achieve a steady income stream from the replanted area, this would be achieved by harvesting 10 hectares a year from the year 2030 as is illustrated in Figure 1. The cumulative deficit of \$103,000 is paid off in 2002 with revenue from timber. It is assumed that sufficient funds are reserved from sales of timber to meet the future costs of silviculture and management for the new plantings. The harvest of 10 hectares a year from 2030 will add \$151,220 net to the annual farm income. The WACC of \$55,610 post tax at this point equates to 27% of NOPAT, a more sustainable and less risky situation than that without trees when 100% of NOPAT was needed to meet the cost of capital.

The two time zones that generate concern for this property in its bid to achieve a sustainable yield of timber are:

- 1993-2002 a nine year period in which \$103,000 will be added to the existing farm debt
- 2003-2030 the twenty seven year period in which the replanted woodlots require tending until they reach maturity.

The two scenarios examined address the problem periods and measure the effect of decisions made in that time on subsequent earnings in the years after 2030 when the farm has a regular yield of 10 hectares a year.

Short Term Scenario - existing levels of debt made the possibility of financing a deficit of \$103,000 over the nine year period unlikely. Selling the woodlots as immature forest under a forestry right reduces the funding cost of the farm, the WACC is now \$39441, and removes the cumulative deficit forecast to 2002. The cumulative cash flow now shows an increase in funds until 2002 but then cash reserves being depleted, as the replanted forests require pruning and thinning, until harvest in the year 2030. This suggests the possibility of replanting the woodlots is not a feasible option for the landowner. The internal rate of return (IRR) of this option is 7.2% pre-tax, 5.5% post-tax.

Long Term Scenario - forestry right agreements on the new plantings enable the woodlots to be replanted and tended to harvest at no significant cost to the landowner, as grantor, and still achieve an annual net revenue from forestry from the year 2030, albeit at a lower level due to the share required by the grantees of the forestry right. The annual net revenue averages \$19,682 from 1993 to 2030, the WACC is 67% of NOPAT through these years. The yield from forestry from 2030 reduces from the \$167,390 gained in a wholly owned operation to \$104,180 under a 50% forestry right on the assumption that new plantings are also on a forestry right. From the year 2030 the WACC represents 27.5% of net farm revenue.

RISK MANAGEMENT

Pastoral farming systems in New Zealand are prone to both environmental and economic variability. In 1993 the farm generated sufficient NOPAT to meet its cost of capital with no surplus available for further development of the property or as a buffer against drought or market price decline in sheepmeat, beef or wool. From a risk management perspective the structure was not robust. It would have had difficulty handling the changes in beef prices that have occurred since 1993.

The sale of the existing immature trees on a forestry right generated an annual surplus which provided a risk management tool, or buffer, against uncertainty (Table 2). However, replanting the harvested areas led to a decline in subsequent years putting the farm back into an untenable position.

Activity	WACC/NOPAT %	Average Annual Cashflow \$
Farming	100.0%	0
Farming & Forestry		
1993-2001	130%	-12864
2002-2029	56%	44564
2030...	27%	151220
Sale of 96% of Forest		
1993-2001	72%	15620
2002-2029	108%	-3050
2030...	19%	167390
Sale of 96% of Forest & 50% Forestry Right		
1993-2001	67%	19409
2002-2029	67%	19772
2030...	27.5%	104180

The surplus generated from the combination of selling 96% of the existing trees and developing the new plantings under a 50% forestry right provides a useful financial buffer for the farm right through to the year 2030. To own the forests outright is the most profitable option but if existing debt precludes this option the cashflows of the 37 years preceding the establishment of a sustainable forestry system, and therefore the viability of the farm, can be improved through the use of forestry rights on both existing and new plantings of trees.

CONCLUSION

While the solution of a sustainable annual yield of forestry is seen as a desirable result for pastoral farmers and one that will ensure land aggregation is not the only way to maintain an economic unit, the method by which farms can achieve this result must be thoroughly examined. Short term cash flows must be compared with the medium and long term cashflows to understand the effect of decisions made today. Forestry plantings if followed with silviculture lock farms into long term commitments which must be properly understood and compared with the commitments likely under joint venture agreements.

Figure 1

Annual Cashflows from Farming and Forestry Systems

