Investing in pasture development

Published – 8 July 2019 | By Georgie Thomson & Tristan Wardley (Agriculture Victoria)

The key criterion in judging whether an innovation is worth adopting concerns the extent to which the innovation is likely to help the owners achieve their goals (Malcolm, Makeham & Wright, 2005).

This article considers the decision to invest in perennial or annual pastures

The process of valuing pasture investment involves judiciously weighing all the benefits and costs involved in the decision. This can be done by either constructing a budget of the whole farm and seeing how the business might operate once the change has been made; or by looking only at the parts of the business that will change with the investment, called a partial budget Discounted Cash Flow (DCF) analysis.

The DCF approach as outlined by Malcolm (2005) involves:

1. Estimating the dollar value of the expected benefits and costs
2. Subtracting the extra costs from the expected extra benefits
3. Expressing the net benefits as a percentage return on capital
4. Comparing those benefits with other uses of the capital either on farm or elsewhere in the economy
5. And finally, Investigation of the risks surrounding the outcome (commonly price and yield)

The Evergraze calculator has been used to illustrate how you would compare perennial and annual pasture investment decisions. It's encouraged you enter your own data to make an informed decision relevant to you and your farm.

Some important points to keep in mind when thinking about the investment of improving pasture include:

- Expected pasture life (salvage value)
- Cost of maintaining new pasture (annual maintenance costs)
- Opportunity cost
- Stocking rate

- Profit
- Risk
- Your goals

Case study

The following case study compares investing in the establishment of perennial and annual pasture. While the assumptions and figures will vary between farm businesses the *process* will be similar.

Assumptions	**Perennial Pasture Establishment**	**Annual Pasture Establishment**
Paddock development costs: Sowing, seed, fertiliser, spraying	$519/ha	$544/ha
Annual maintenance costs	$50/ha	
Paddock & Pasture Production Values		
Expected pasture life	10 years	1 year (re-sown annually)
Chance of pasture failure	10%	20%
Stocking rate before improvement	15 DSE/ha	15 DSE/ha
Peak stocking rate after improvement	20 DSE/ha	40 DSE/ha
Time to reach peak stocking rate	2 years	
Year when stocking rates start to decline	8 years	
Stocking rate at end of pasture life	15 DSE/ha	
Number of weeks pasture grazed in year of sowing	24	24
Economic & Financial values		

Agistment costs DSE/week	$0.50	$0.50
Gross margin before improvement/DSE	$35	$35
Gross margin at peak stocking rate/DSE	$38	$38
Capital cost of livestock/DSE	$50	$50
Opportunity cost	7%	
Expected annual inflation rate	2%	
Marginal tax rate	30%	
Interest on borrowed funds	3%	
Results		
Net present value	**$27,352**	**$65,674**
Internal rate of return	15.4%	34.0%

Based on our assumptions, the analysis has shown that an investment in either perennial or annual pastures is likely to make a positive contribution to the business. However, in this case the ***annual pasture will have a higher return on capital*** and therefore looks to be the more efficient choice.

Scenario Analysis

When comparing two options it is important to not only consider the likely return on capital (efficiency) but also the level of risk involved. This is important because most decision makers have a different risk profile, what one considers risky another may not. Risk preferences can be represented in the analysis by isolating the main drivers of profit and manipulating them to represent best and worst case scenario. In this example gross margin per DSE and stocking rate per hectare have been chosen. The risk analysis gives the decision maker an idea about the associated profits and losses and whether those outcomes are within their personal risk tolerance.

Scenario Analysis	**Net Present Value**		
	Low	**Expected**	**High**

Gross Margin	**$30**	**$38**	**$40**
Annual	– $26,386	$151,524	$196,001
Perennial	– $36,703	$27,352	$237,347
Stocking rate	**Low**	**Expected**	**High**
Annual	**40 DSE/ha**	**45 DSE/ha**	**50 DSE/ha**
	– $20,176	$65,674	$237,374
Perennial	**16 DSE/ha**	**20 DSE/ha**	**25 DSE/ha**
	– $14,995	$27,352	$97,929

It is important to note that results will vary between farm businesses, based on production assumptions, soil, climate and management.

Important points

When considering investments decisions such as this, it is important to use opportunity cost correctly. Opportunity cost (the discount rate) is the value of what you give up by choosing a particular course of action and is what makes the DCF method so powerful. Opportunity cost gives perspective; it enables the decision maker to make a relative judgment about how well the capital is being used compared to other uses on farm or elsewhere in the economy. In this example the DCF gives an Internal Rate of Return (IRR) for annual pastures of 34%. This means that if profits are reinvested and able to make similar returns, then the investment will generate a 34% return on capital. Relative to other uses of capital available in the economy (of similar risk) this investment looks to be a good one.

Being judicious about investment decision means understanding the impact on the whole farm system. The partial approach used in this analysis does not take into account many aspects of the farm system. Management, technical capability, as well as the complementary association that may exist between activities within the farm. The partial DCF should only be used as the first step (do the numbers stack up?). The next part of the decision process involves analysing your goals, ability, risk profile and outlook for the future. Finally, a common sense check should be applied, if something looks too good to be true, it probably is.

How does your investment decision stack up?

Further Information

Visit the Evergraze Pasture Improvement Calculator to compare pasture investment decisions on your farm.

Malcolm, B. Makeham, J. Wright, V. (2005). *The Farming Game – Agricultural Management and Marketing* (2nd ed.). Melbourne, Cambridge University press.

Acknowledgements

Neil James (Agriculture Victoria)