

MAKING PASTURE ESTABLISHMENT PAY:
IT'S THE BOTTOM LINE THAT COUNTS

Michael Townsend
"Glenbrook"
Canowindra NSW

In making pasture establishment pay it most certainly is the bottom line that counts. In my situation there are three major factors that have influenced the overall profitability of the farming enterprise:

- (a) An increased supply of better quality feed, thus increased stock numbers.
- (b) Better control of problem weeds, leaving cleaner seed beds for the next cropping phase of the rotation.
- (c) Increased soil fertility, meaning lower fertiliser inputs for following crops.

"Glenbrook" is 800 ha of light sandy loam in undulating country 20 km north of Canowindra. It is ideally suited to crop production, lamb raising and wool production.

THE PREVIOUS SITUATION

About six to seven years ago we were cropping 500 - 600 ha annually, with first cross ewes utilizing the balance of the area for prime lamb raising. With ever increasing costs associated with cropping and with falling returns, a decision was made to diversify our operations and run more dry sheep.

Crop yields had been showing a steady decline for several years, and in spite of using legumes in the crop rotation, and nitrogenous fertiliser we were concerned that our country wasn't producing as well as it had been in previous years. Several attempts to establish lucerne and clover had failed, or all but failed. This presented a very bleak outlook. We couldn't grow wheat profitably and couldn't establish pasture using conventional methods.

The inability to establish good stands of legume dominant pasture was a major problem. This resulted in the carrying capacity of the land being reduced to about two sheep per ha diminishing as the effects of cultivation dissipated and the weed population increased. Soil left in this condition was susceptible to invasion by undesirable unpalatable weeds. Also, much of the soil was prone to erosion causing a further loss of both top soil and moisture.

Because of the poor quality of the pasture the ley period was shortened. If you can't run many stock on a particular area it becomes necessary to plough it up again in an attempt to grow a more profitable alternative. However, by not having the benefit of legumes in the pasture ley there is no soil nitrogen build-up. Consequently the following crops don't yield any better than previously.

RECTIFYING THE PROBLEM

We decided that pasture improvement offered us the greatest opportunity for rectifying our undesirable farm situation. In order to achieve maximum

benefits from pasture improvement, we first had to change the soil chemistry to permit pasture to be established. We had identified a rather serious acid soil problem with the compounding effects of high aluminium. Soil testing was essential to identify this problem. In the case of lucerne and clover, low pH and high soil aluminium have to be corrected by adding lime to the soil. Lime applied at 2.5 t/ha increased the pH from 4.2 to 5.2 and reduced the aluminium level from about 30% to zero. The extra cost of \$100 per ha was soon repaid by increased productivity.

Having been plagued with poor pasture establishment for some time we had an urgent need to stop failures. We recognised that the cover crop may have caused too much competition for moisture in early summer. Dropping the seed directly behind the combine may have buried it too deep. The seed bed may have been too loose and cloddy and weed control not up to scratch.

Applying lime early in the cropping phase allows it to be incorporated during the normal cultivation practice. It also has time to neutralize the acidity and reduce soil aluminium. Stubble is burnt in autumn and the land worked with scarifier. Trifluralin is applied and cross worked with the combine. The pasture is sown without a cover crop in April - early May. We removed the seed box from the combine and mounted it on a separate trailer behind. This allows the combine harrows to level the ground behind the tyres and leave a flat seed bed for the pasture seed. A rubber tyred roller is then attached behind the seed box to act as a press wheel and firm the soil, thus ensuring a better seed-soil contact. We first used this method in 1983 and have not been disappointed with it since.

Weed control is essential, not only at the time of establishment but every year, if full benefits are to be achieved. Lucerne and clover persist longer if they don't have to compete with dense stands of ryegrass and thistles. The benefits of a clean seed bed with high nitrogen content cannot be achieved if these weeds are permitted to seed during the pasture ley period.

ECONOMIC ANALYSIS

The costs and returns of our pasture improvement programme were estimated using cash flow budgets. These budgets show the pasture establishment and maintenance costs incurred and the returns from increased sheep production over a six year period. A ten hectare unit is used as the basic unit for these budgets. The first year costs include land preparation, seed, herbicide, fertiliser and sheep expenses. The following budget assumptions are made:

- (a) the programme is financed with borrowed funds under an overdraft-type arrangement; interest is 18 percent;
- (b) no funds are taken out of the programme for other purposes;
- (c) all sheep are purchased; this also applies to situation (i) described below.

Other costs and price assumptions are detailed in the attached budget (appendix 1).

Figures are presented for three situations:

- (i) a poor quality pasture situation which is the case if no pasture improvement is undertaken; the only annual costs incurred here are for fertiliser in Year 1 and sheep costs;

- (ii) a situation following pasture improvement based on fairly conservative stocking rate increases;
- (iii) the same situation as (ii) but with stocking rates we feel we should be able to carry.

These stocking rates in terms of dry sheep equivalents per hectare are:

	<u>Situation (i)</u>	<u>Situation (ii)</u>	<u>Situation (iii)</u>
Year 1	2	2	2
Year 2	2	5	5
Year 3	2	7	8
Years 4 - 6	2	10	12

The cash flow budgets for the three situations are presented in table 1 (an example of the budget format used is attached - Appendix 1). Some explanation might assist interpretation of these budgets.

Net return is the difference between annual costs and returns. Cumulative balance is the total of the annual returns plus interest costs over the six years. Net present value is the sum of the annual net returns converted to present day values using discount rates to allow for the impact of inflation over time. Discounting recognises that a dollar today is not going to be worth a dollar tomorrow because of inflation. Here we used a discount rate of 10% which assumes that the value of the dollar will fall 10% per annum. Net returns and their net present values make up the bottom line in making pasture establishment pay.

DISCUSSION

Pasture improvement at 'Glenbrook' has enabled us to substantially increase our stocking rates and change a generally uneconomic run-down pasture to a profitable situation. The cash flow results show that the pasture establishment costs are recovered in four years with profits of between \$334 and \$445/ha, after allowing for all pasture establishment, maintenance and interest costs. In today's values the net returns at the end of the sixth year are between \$250 and \$325/ha.

A further economic advantage from pasture improvement is the increased yields and profits we have achieved when we go back into cropping. These are demonstrated in the following gross margins. (table 2).

TABLE 1. Cash flow results for pasture improvement at "Glenbrook"

Year	1	2	3	4	5	6
Total Costs						
(i)	757	216	216	216	216	216
(ii)	2300	1219	1130	1614	1080	1080
(iii)	2300	1219	1425	2044	1296	1296
Net Returns						
(i)	-130	411	411	411	411	411
(ii)	-1673	348	1065	1494	2055	2055
(iii)	-1673	348	1083	1718	2466	2466
Cumulative Balance						
(i)	-153	258	699	1080	1491	1902
(ii)	-1974	-1919	-1008	486	2541	4596
(iii)	-1974	-1919	-986	732	3198	5644
Interest Costs						
(i)	23	-	-	-	-	-
(ii)	301	293	154	-	-	-
(iii)	301	293	150	-	-	-
Net Present Values						
(i)	1428					
(ii)	3325					
(iii)	4045					

TABLE 2. Impact of pasture improvement strategy on cropping gross margins

	<u>With No</u> <u>Pasture Improvement</u>		<u>After</u> <u>Pasture Improvement</u>	
	<u>Yield</u> (t)	<u>Gross Margin</u> (\$/ha)	<u>Yield</u> (t)	<u>Gross Margin</u> (\$/ha)
Rapeseed	1	\$92.50	1.8	\$246.10
Wheat	2	\$ 4.78	3.0	\$ 71.78
Wheat	2.5	\$38.28	3.75	\$122.03
Oats	2	\$43.97	3.5	\$129.47

APPENDIX 1. General pasture improvement budgeting format

(Enterprise Unit (ha) 10.0)

Merino wether enterprise

Mortality rate (%)	5.00
Culling (%)	10.00
Wool cut (kg)	5.50
Wool Price (\$/kg)	5.50
Replacements (\$/hd)	22.00
Cull wethers (\$/hd)	11.00
Variable costs (\$/hd)	7.50

Stocking rate	dse/ha
Year 1	2.0
Year 2	5.0
Year 3	7.0
Year 4-6	10.0

Stocking schedule

Years	1	2	3	4	5	6
Potential	20	50	70	100	100	100
On hand s/y	0	17	43	60	85	85
Purchases	20	33	28	41	15	15
Culls	2	5	7	10	10	10
Deaths	1	2	3	5	5	5
On hand e/y	17	43	60	85	85	85

Seed Mix

	kg/ha	\$/kg	\$/ha
Lucerne	4.00	4.00	16.00
Subclover	3.00	1.50	4.50
Cocksfoot	0.00	2.00	0.00
Sirosa phalaris	0.00	3.70	0.00
Australian phalaris	0.00	2.40	0.00
Total		\$	20.50

Seed treatment (\$/ha) 1.35 (Lime pelleted and inoculated)

Fertiliser programme

Fertiliser price (\$/t)	303.00	Double superphosphate
Cost of application (\$/t)	0.00	
Lime applied (\$/t)	40.00	

Year	1	2	3	4	5	6
Superphosphate (kg/ha)	55	0	0	0	0	0
Lime (t/ha)	2.50					

Establishment costs

Years	1	2	3	4	5	6
	(\$/10 ha)					
Harrow @ 2.00/ha	20					
Scarify @ 5.00/ha	50					
Cult./plgh @ 5.20/ha	52					
Wideline @ 0.00/ha	0					
Rabbit cont. @ 0.00/ha	0					
Herbicide @ 10.75/ha	108					
RLEM cont. @ 6.90/ha	69					
Sow @ 4.00/ha	40					
Seed @ 20.50/ha	205					
Seed treat @ 0.00/ha	0					
Fertiliser @ 303.00/t	167	0	0	0	0	0
Fert applic @ 0.00/t		0	0	0	0	0
Lime applic @ 40.00/t	1000					
Allowance for failure (1 year in 6)		118				
Stock purch @ 22.00/hd	400	726	605	891	330	330
Stock costs @ 7.50/hd	150	375	525	750	750	750
Total costs	2300	1219	1130	1641	1080	1080
Returns						
Wool sales	605	1513	2118	3025	3025	3025
cfa sales @ 11.00/hd	22	55	77	110	110	110
Total returns	627	1568	2195	3135	3135	3135
Net returns	-1673	348	1065	1494	2055	2055
Interest	-301	-293	-154	0	0	0
Cumulative balance	-1974	-1919	-1008	486	2541	4596
Net present value	3325					
Interest on borrowed funds		0.18				
Discount rate		0.10				
Present value of annual net returns	-1673	316	880	1122	1404	1276

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