Operating a grazing property in a high rainfall tableland environment

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Introduction

It was proposed that the topic for this talk would be "Does it pay to improve pastures in high rainfall environments?". The fact is that I cannot show one way or another whether it does pay to improve pastures in our high rainfall tablelands district. The best that I can do is to tell you what we have done and the results that we have achieved. While our pastures contribute to those results, they are only one of many factors contributing to our productivity. Hence the change in the paper title.

Land and Resources

The three properties we operate in the Millthorpe area total just over 1,540 ha including 104 ha of leased land. The average annual rainfall is around 800 mm with an elevation varying up to just over 1,000 metres.

Soils

Soil types vary quite considerably from the basalt derived soils through to andesite and quartz with alluvial grey and black soils on the lower slopes and flats. Phosphorus levels vary considerably, from lows of under 20 mg/kg (Colwell) to over 90 mg/kg. Soil pH's range from 4.3 to 5.1 ($CaCl_2$) with a liming program targeted to achieve a pH of 5.5 ($CaCl_2$).

Pastures

Arable areas have, in many cases, long established phalaris stands. Ryegrass based pastures were sown in the 1950's & 1960's on the arable land. These have been resown in more recent years to cocksfoot, phalaris and fescues mostly in combination. Steeper less arable country has been sown to phalaris and phalaris / cocksfoot mixes by using direct drill techniques. Cropping has been abandoned for several years now as part of the pasture renovation process and all pastures are sown without a cover crop and mostly by direct drill.

In recent years the pasture mix has included fescue, cocksfoot, chicory and where appropriate lucerne. The objectives with these pastures is to get a response to rainfall at anytime of the year and to better utilize lower, wetter country that we have been able to improve over the recent dry years with direct drill equipment. In March of 2004, for example, we established a pasture on what is normally wet and low ground (13 ha Swamp paddock) that consisted of Advance Tall Fescue (6 kg/ha), Resolute Tall Fescue (3 kg/ha), Holdfast Phalaris (1 kg/ha) along with Balansa clover (.25 kg/ha), Tahora white clover (.5 kg/ha), Riverina sub clover (2 kg/ha), Leura sub clover (1 kg/ha) and Denmark sub clover (1 kg/ha).

In effect we are trying to extend our growing period and have pastures that will put weight on our sale stock at any time of the year.

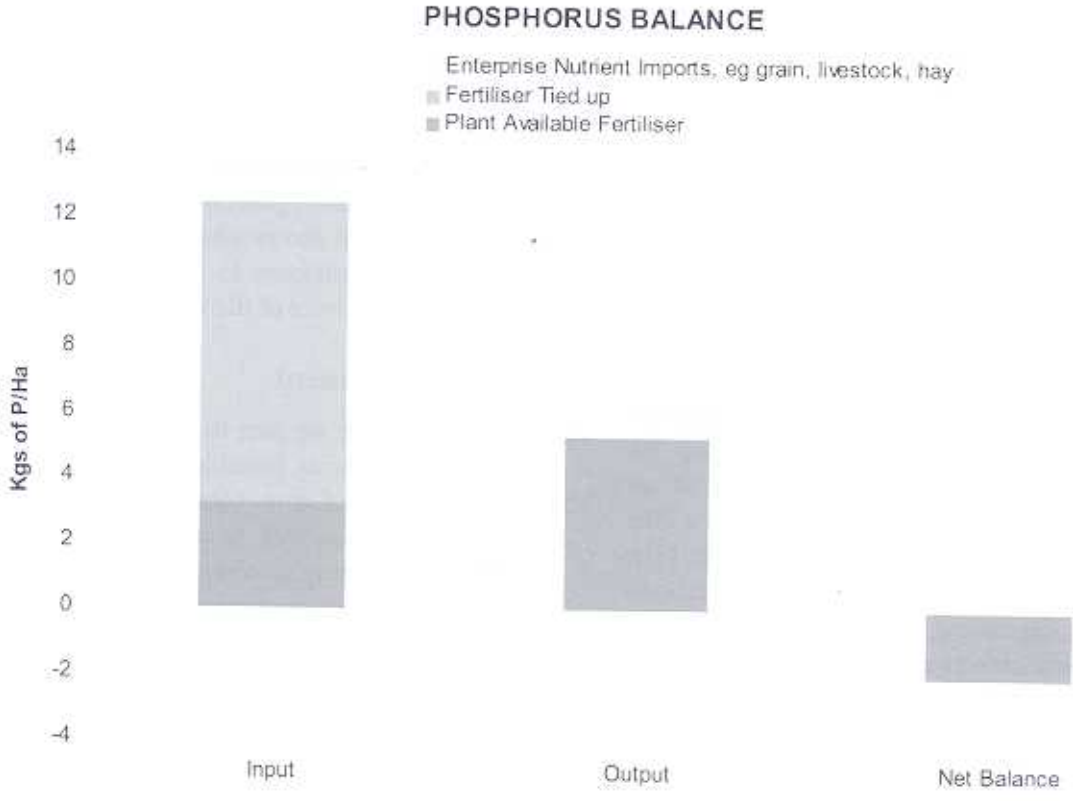
Pastures are very expensive to establish or re establish and our objective has been to sow pastures for the medium to long term. Typically our seed cost has been in excess of $100/ha and when combined with fertilizer, lime and machinery costs the total costs exceed $200/ha. On top of this cost is the loss of production for the period when the pasture is establishing. The dedicated pasture approach generally results in full production being obtained fairly quickly. I expect these pastures will still be producing well in 40 to 50 years time with sound management practices.

Fertilisers

Our fertiliser program aims to balance nutrient removal and the Holmes and Sackett benchmarking nutrient audit (Figure 1) gives a regular guide as to how effective we have been in achieving that objective.

Typically pasture paddocks are fertilised annually at a rate of 10 kg/ha of Phosphorus (P) with the silage / hay paddocks about double that rate

Figure 1.



(20 kg/ha P). Over recent years we have tried to target paddocks, firstly on their nutrient status (P) and secondly on their productivity (stocking rate). Soil testing has enabled us to tailor a program to nutritional status and has resulted in significant savings targeting those paddocks with a P deficiency (less that 40 mg/kg Colwell) and bypassing some with abundance.

In 2003 we purchased the program Paddock Action Manager (PAM) with the idea that it would help identify our most productive paddocks and in the hope that one day remote sensing may help us in our stocking decisions. We are now in our second year of accumulating data and I have to admit that the results are not what I expected and quite inconsistent. The problem is that we are not managing paddocks uniformly and that pasture utilization in some paddocks is much less than others. It has, however, been quite a useful tool in that it highlights this discrepancy and it is a useful program in other aspects.

Lime has played an important role in our pasture program for many years. In recent years we have become a little more systematic with a regular program based on soil tests of individual paddocks and liming to a target pH of 5.5 ($CaCl_2$). Application rates have varied with up to 3 t/ha being applied. We have spread on average around 300 tonnes per annum over the last 5 years. Most of this has been as a topdressing rather than incorporation.

The economics of liming are debatable in that productivity gains are very slow following application. We regard liming more as a protection of our capital base in that if acidification is ignored in the long term we will erode the value of our asset.

Livestock

Cattle

We have a herd of composite cows (25% European and 75 % British) weaning 450 to 500 head of calves. Steer calves are carried through to feedlot entry weights of 400 to 500 kg liveweight (LWt) at around 18 months of age. Calving is in August / September with weaning in March / April. Heifer calves are retained as replacements and joined at a minimum weight of 280 kg at 15 months of age. There is an emphasis on a restricted calving pattern and high reproduction rates. The cow herd, including followers, is targeted to average around

10,000 Dry Sheep Equivalents (dse) per annum with a target production of 20 kg beef per dse and 40 kg beef / 100 mm of rainfall with a cost of a production of $0.75 per kg.

Sheep

We have a prime lamb enterprise that is undergoing a transition from a traditional tablelands production system (i.e. western bred first cross ewes joined to a terminal sire) to a self-replacing composite type system. This year we will lamb down 1600 composite ewes and 1200 Merino ewes joined to terminal sires. In addition we have joined over 900 composite lambs to maternal composite rams and expect about 600 of these to lamb this season. We are joining composite lambs at 7 months of age and at this stage we are achieving around a 70% pregnancy rate and 100% conception rate. (The empty ewe lambs can be sold as lambs or retained as breeders depending on seasonal conditions). Our short term objective is to run 4,000 composite ewes (10,000 dse enterprise) producing 23 kg dressed weight (DWt) per ewe and 20 kg DWt lamb per 100mm of rainfall at a cost of production of $1.50/kg DWt.

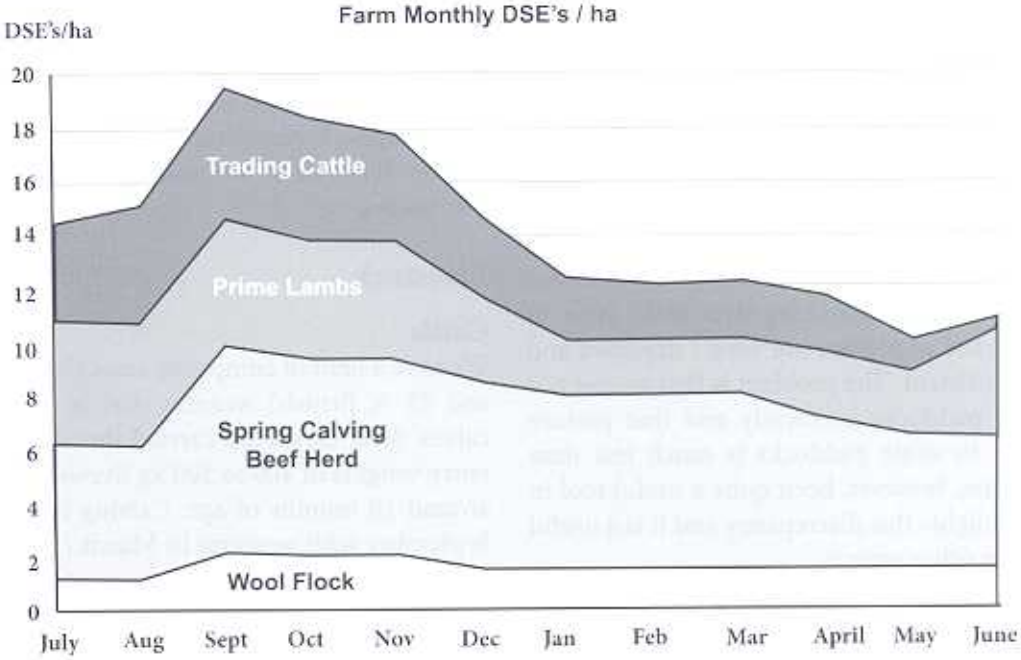
Our overall objective is to run 25,000 dse annually given average rainfall. Alternatively our objective is 2 dse per ha per 100 mm of rainfall, so in theory we will run more stock in above average rainfall years and less in below average rainfall years. Our beef and lamb enterprise account for about 20,000 dse of this total. We fill the balance with a cattle trading enterprise or take agistment stock to utilize available pastures and to meet our objectives. I include a graph (Figure 2) generated in our Holmes & Sackett Report that shows what and how much these enterprises contribute to whole farm feed demand at different times of the year.

Grazing Management

As a broad objective we aim to convert as great a percentage of grass as possible to cash. I have attended Prograze, Grow more, Graze more Gain more courses as well as observing at first hand a range of grazing systems in Australia and New Zealand. The grazing approach we take is influenced by all these experiences. We have a very good understanding of the seasonality and variability of grass production.

I guess the best way to describe our grazing management system is as being flexible and variable. Having said that, the ewes and cows are basically set stocked, or slowly rotated, from just prior to parturition until weaning. Wet ewes we

Figure 2.



run in mobs of around 200 with lambs weaned by the end of December at the latest. Last year we weaned all lambs at 12 weeks of age and gave these lambs priority pasture. After weaning the ewes are consolidated into larger management mobs (5-700) and rotated behind priority stock or tactically to manage pastures and achieve various objectives with regard to pasture utilization, ground cover and body weight and condition of ewes in the lead up to joining and lambing. About 7 weeks prior to lambing the ewes are scanned into multiples and singles and once again managed to achieve both stock (condition) and pasture objectives (at time of writing we are once again feeding to achieve these objectives).

Wet cows are run in mobs of 50 to 70 head until weaning in March /April at which time they are pregnancy tested. Empty and Cast for Age (cfa) cows are separated and sold. The remaining cows are consolidated into larger mobs and tactically rotated with similar objectives to the ewes until just prior to calving.

Our priority stock are our sale lambs, steers and other trading stock (cows, heifers). These stock are generally given access to our highest quality pastures throughout the year with pasture growth stage and length critical to performance.

The value of good clean water is critical to livestock performance. Over recent years we have found it necessary to upgrade our water supply and reticulation systems to be able to best manage our pastures. This has required quite a substantial investment but has probably resulted in some productivity gains.

Tips and Tools

As a valuable aid in tracking how our overall stocking rate compares with target rate I have developed a simple spreadsheet in excel. I update this periodically and use it as an aid to both purchasing and sale decisions.

Why Benchmark?

I guess the main reason for becoming involved in the Holmes & Sackett benchmarking group was the belief that to improve it is necessary to analyse performance on a regular basis. In addition the group provides a forum for challenge. The worst thing is to fall into complacency.

Benchmarking results

There are a few points I would like to make before I discuss the results of our benchmarking performance since we commenced in 1991/92.

Firstly, our business is at best only average when compared with the other members of the group. Don't be too disheartened by our results, as there are many operators with better results. Based on this, there will be many at this conference who will regard our results as being mediocre.

Secondly, the focus of our group has been to compare performances over a particular period. There has not been an emphasis on analysing improvement (or otherwise) over time. Therefore, it was quite challenging to sit down and sift through the results to see if anything changed over this period and more importantly to see what factors were driving improvement (if any).

Productivity

I will now go through the results of our analysis and try to explain how and why things happened. This is a Grasslands Conference and I guess delegates expect some sort of input / output relationship. As previously mentioned we do not keep records that will help in this regard.

If there has been any improvement in productivity it will have come as a result of increased pasture production and/ or increased utilisation of pasture. Therefore I suggest that our productivity gains come from a combination of these two factors.

After reviewing the sets of data it was decided that production per unit of rainfall was probably the most relevant yardstick. On this basis we have increased our stocking rate by an average of around 0.5 dse per 100 mm of rainfall. Lamb production has improved from 10 kg/ha (DWt) to around 16 kg/ha (DWt) /100 mm rainfall (Table 1) Beef production has improved from 22 kg/ha (LWt) to 35 kg/ha (LWt) /100 mm of rainfall (Table 1).

Overall the average annual stocking rate has improved from 10 dse/ha to around 14 dse/ha (our objective is 16 dse ha).

Cost of Production

To be in the game for the long run it is best to have a low cost of production. Table 2 shows how the cost of production of beef and lamb has changed over the period 1993/04 to the present.

Table 1. Rainfall, stocking rate, beef, lamb and wool production for the "Oatleigh" properties

Year	Annual Rainfall (mm)	Stocking Rate Average (dse/ha)	Stocking Rate 100mm (dse/ha)	SR Mid winter (dse/ha)	Beef kg/ha (LWt)	Lamb kg/ha (DWt)	Wool kg/ha clean	Beef kg/ha 100mm (LWt)	Lamb kg/ha 100mm (DWt)	Wool/ha kg clean	Beef dse labour unit	Lamb dse labour unit
1993 94	830	11.3	1.36	-	240	-	37.1	29.9	-	37.1	6860*	
1994 95	638	10.0	1.57	-	296	-	37.0	46.2	-	37.0	6026*	
1995 96	624	8.9	1.42	-	337	-	71.0	40.2	-	71.0	5791*	
1996 97	640	9.4	1.46	-	162	60	30.0	22.7	8.3	30.0	5,996	5,631
1997 98	804	11.4	1.41	9.6	180	82	47.6	22.5	10.2	47.6	7,681	5,085
1998 99	850	12.5	1.47	8.8	246	119	52.3	29.2	14.0	52.3	10,200	4,489
1999 00	919	11.5	1.25	13.2	207	108	24.9	22.6	11.8	24.9	16,510	8,127
2000 01	770	13.8	1.79	14.0	286	116	35.4	37.4	15.0	35.4	12,907	5,125
2001 02	710	11.3	1.60	10.0	207	110	41.5	29.2	15.5	41.5	9,697	3,002
2002 03	504	10.6	2.10	12.6	213	90	62.6	42.3	17.8	52.5	9,973	4,546
2003 04	882	14.1	1.60	14.6	300	129	39.6	34.0	14.7	39.6	10,799	6,413
2004 05												

* Based on DSE/labour unit

Of concern is the increase in the cost of lamb production over recent years. Given these trends our target of $1.50 /kg (DWt.) may seem optimistic. However we are confident that this upward trend can be reversed after a transition in our breeding program and flock productivity begins to pick up. Some of this increase in cost of production comes about because we are changing from a traditional flock structure (buying in ewes) to a self replacing flock. Hence a non cash cost (ewe depreciation) is replaced by a cash cost as fewer animals are sold in the production cycle. The top 20% of producers in our benchmarking group have an average cost of $ 1.81 /kg (DWt) so we will be doing well to get our costs back to $1.50 /kg (DWt).

Our cow herd seems to keep ticking over fairly efficiently and we expect that infrastructure improvements over recent years will enable us to lift our productivity and achieve our target of $0.75/kg providing we return to more normal seasons.

We rely on a dedicated and experienced workforce to manage our stock and maintain improvements. Over recent years we have needed to reduce our labour requirements (sale of land) and now have a policy to outsource skilled labour for most of the infrastructure projects and some seasonal stock operations.

I must say that I am not all that happy with the way we keep and report our labour records in that allocation between enterprises is a "best estimate", and we may need to address this in the future. On this basis however, there is apparently a substantial increase in labour productivity over the period 1996/97 to 2003/04 for the beef herd and little change with regard to the lamb flock (Table 1).

Overall our productivity per labour unit has increased from around 4500 dse per unit in 1990/91 to around 7000 per unit (all enterprises) with an objective of just over 8000 per unit in the current planning period.

Profitability

Improvements in productivity are irrelevant if this does not convert to profitability. The relevant measure here is return on assets (Table 2) and also perhaps net profit per ha (Figure 3) While our profitability has generally been improving it has been a rollercoaster ride and has a correlation to our terms of trade and the $US / AUD exchange rate.

The average rate of return at 2.81% is not very encouraging, however it must be remembered that it is calculated on a fluctuating but rising land value that includes the value for stock and plant and after an allowance for the owners salary.

The other component of profit is capital gain and may be loosely correlated with productivity. Each year as part of the benchmarking process we are required to estimate the value of land owned. This is summarised in Figure 4 which shows an average increase of $88.00/ha/year or 4.5% over the period.

The two components combined give an annual return of just over 7%, a fairly modest return in any context.

Table 2. Financial costs, returns, profitability and valuations for the "Oatleigh" properties

Year	Wool cost $/kg clean	Beef cost $/kg cLWt	Lamb cost $/kg cDWt	Wool returns $/kg clean	Beef returns $/kg cLWt	Lamb returns $/kg cDWt	Return on Assets (%)	Profit $/ha	Land value $/ha	Plant and equipment value $/ha	Livestock value $/ha	Total value Assets $/ha	Land value $/DSE
1993 94	5.33	0.65	-	3.69	1.19	-	2.90%	60	2,311	112	292	2,736	216
1994 95	6.84	0.55	-	6.64	0.87	-	1.40%	39	2,312	161	266	2,739	236
1995 96	2.25	0.41	-	4.44	0.88	-	1.90%	45	1,985	180	226	2,400	230
1996 97	11.48	1.04	2.41	6.71	0.75	3.20	3.60%	17	2,366	172	335	2,911	252
1997 98	8.23	1.25	1.07	8.34	0.66	2.16	-1.00%	-22	2,166	122	244	2,272	166
1998 99	6.95	0.60	1.61	6.86	1.07	3.25	3.00%	83	2,109	130	281	2,536	169
1999 00	11.48	0.66	1.20	7.03	1.24	2.06	2.20%	56	2,104	119	314	2,561	180
2000 01	7.47	0.63	1.55	11.86	1.53	3.61	6.50%	153	2,106	99	440	2,750	113
2001 02	5.27	0.92	2.00	9.18	1.91	3.64	6.10%	183	2,355	129	451	3,008	202
2002 03	6.68	1.22	2.23	6.75	1.33	3.07	2.80%	75	2,364	128	361	2,856	191
2003 04	7.31	0.95	2.53	9.15	1.83	3.96	6.90%	224	2,770	197	548	3,798	202
2004 05									3,291				

Defining Moments

We have always been committed to our business however there have been some "tipping points" where the emphasis or direction has changed. I believe these have been critical and our business would not be what it is today if we had not been through a critical review process.

We found the mid 1990s very difficult. A series of poor seasons were coupled with poor commodity prices. At about this time we changed our accountant who changed our business structure and was instrumental in formulating a written business plan. This process required that we review all aspects of the business and to identify future directions with emphasis on wealth creation.

Significant aspects of the plan included:

- Simplification of the business structure
- Fine tune enterprise mix (abandon stud cattle)
- Expand the business base 25,000 dse to 30,000 dse by leasing land
- Objectives to double return on Assets from 1.5% to 3% after owner's salary.
- Invest surplus funds off farm (proprietors to be financially independent of the farm in 10 years)

Figure 3.

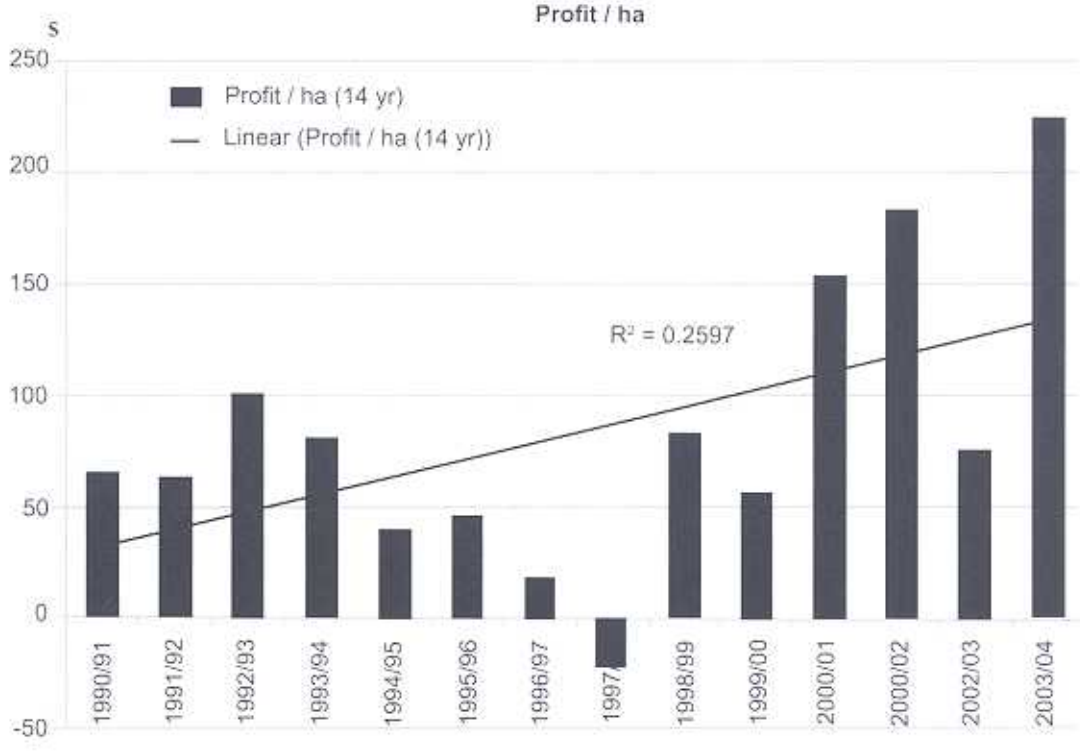
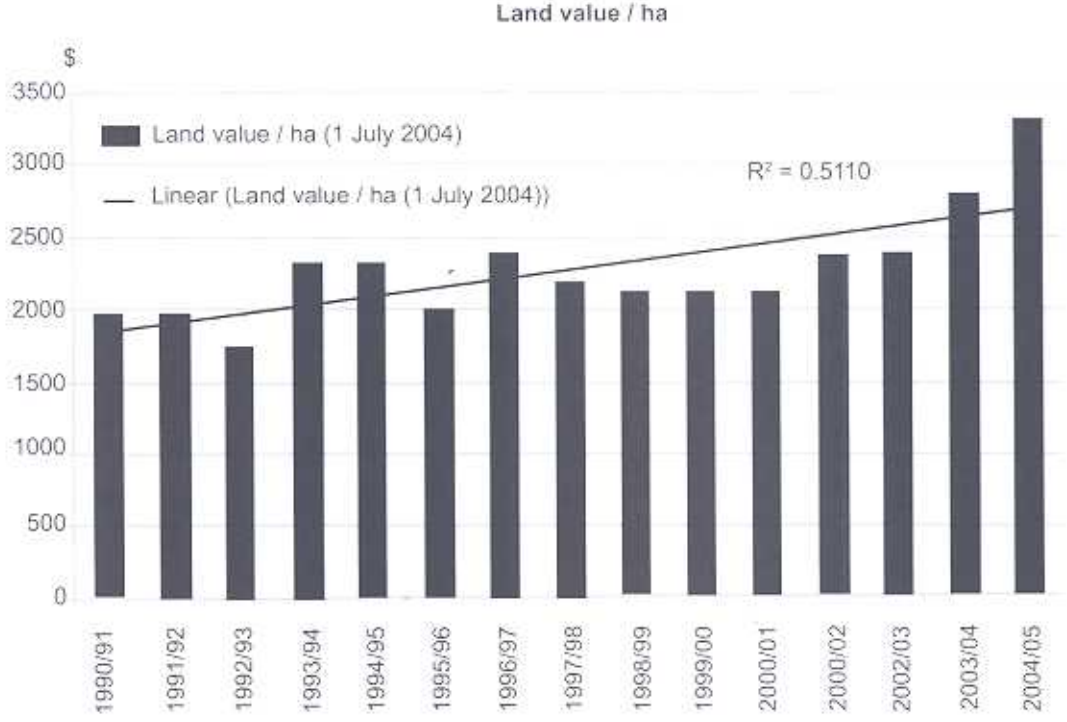


Figure 4.



- Lifestyle and succession issues addressed.
- Increase stocking rate from 10.5 dse/ ha to 12.5 dse / ha
- Produce 200 kg lamb / ha (DWt)
- Produce 300 kg beef / ha (LWt)
- Increase labour productivity from 6,000 to 7,500 dse per man
- Shift shearing from spring to summer (labour productivity)
- Review of plant purchase policy and plant requirements.
- Improve communications (regular meetings) to improve productivity.

Personal development and lifestyle goals were set for each family member and all family members were involved to the extent that they were comfortable. An integral part of this Plan is the annual review process and periodical (5 years) major review of the plan.

A health issue in 2000 resulted in a major reassessment of priorities. We sold land in 2002 that we owned that was remote from the Millthorpe properties and also relinquished the lease of land in the same vicinity. This reduced our stocking capacity from around 35,000 dse to the current level. The decision has however enabled us to be more precise in our management and decision making on our current landholdings and has probably contributed to productivity gains over the last few years.

For the immediate future we plan to continue operating our current land base (Business review of March 2004). However this will involve a transition to commence in the next 4 years from the current management structure to one that will endure for at least the next planning phase.

Conclusion

Everyone is different and I am probably very conservative and risk averse by nature. In addition I am likely to fall back to a personal "comfort level" if left to my own devices.

Improving our pasture is one very important aspect of our grazing business. Of equal importance is utilization of pasture in a profitable way. Setting up the framework is the tricky bit and getting good information, advice and support is the key.

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