PERENNIAL PASTURE MANAGEMENT:

How can I make my pastures more profitable ?

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"Connemara", Oberne Creek

Summary: A grazing system producing wool, beef and rams on the South-West slopes of NSW is described. Set-stocking rates of up to 14 ewes/ha have been achieved. By increasing phosphate level, correcting soil acidity and sowing more perennial pastures, there is potential to increase stocking rate further. Farm profitability is predominantly determined by efficient production and effective marketing, greater profitability is being severely restricted by lack of competition in the promotion of wool.

Our business is a simple production line in which we produce and market wool meat and rams. The production centre is the soil on our property and the livestock which graze upon them. Major inputs are capital, labour, solar energy, water and nitrogen. Other nutrients (P, S, Ca, Mo) are also imported onto the farm in fertilisers. These raw materials are then converted by plants into a readily available supply of nutrition, in the form of pastures, for grazing livestock.

The profitability of this enterprise is determined by the quantity and quality produced, the efficiency of production, how it is processed, and the marketing and promotion of processed goods.

On farm limits to production

Solar energy and hence temperature is a limiting factor during winter as we are located 80 km SE of Wagga between Tarcutta and Tumbarumba. We cannot change this unless we relocate. Average annual rainfall is 750 mm which has a slight winter dominance.

Soils are 75% granite, 20% shale and 5% alluvial creek flats. They are acid (pH $CaCl_2$ of 4.1-4.5) with Al (up to 15 %) and Mn also present at levels which may induce toxicity. Obviously there is much room for improvement in soils. We have started a liming program to correct acidity and lime at 2.5 t/ha is part of the routine for new pasture sowing. Phosphate is very low in most paddocks (3 - 7 ppm Bray) with better paddocks up to 20 ppm. Average application rate of phosphorus over the whole farm this year was 9 kg P/ha as single super. Rates for previous years are presented in Figure 1.

In 1994 we increased P rates up to 22 kg/ha on our better perennial pastures. Responses to this were not immediately obvious due to drought conditions. In 1995 when the drought broke those pastures which received higher rates of P in 1994 responded more quickly. These pastures received only 10 kg P/ha in 1995 and up to 17 kg/ha this year.

Pastures consist of approximately 40% perennial pasture species with the remainder being composed of annual grass (mostly ryegrass, barley grass and vulpia) and native grass (mostly *Microleana* and some *Bothriochloa*) with sub clovers. We have a minuscule amount of lucerne. Perennial pastures consist of mostly Australian Phalaris, a little cocksfoot, some ryegrass (Kangaroo Valley and VPRG), sub clover and small amounts of Haifa white clover.

Australian phalaris is the only perennial grass which we have found that will persist under our heavy set stocking regime. During the drought we destocked paddocks when ground cover decreased to 70% and ran sheep in a feedlot in which Australian phalaris was growing. In this feedlot we had stocking rates of 450 sheep/ha for up to three months. At least half of the phalaris survived under these extreme stocking conditions.

We have tried Sirolan and obtained very good establishment although it was almost completely eaten out in the 2nd and 3rd year. Cocksfoot will persist in a few places, however, it is usually pulled out of the ground because of its upright clumpy nature. Perennial ryegrasses will persist in most moist areas.

Table 1. Stocking rate and performance on a perennial pasture at "Connemara"

Stocking rate (ewes/ha)	Age (years)	Greasy wool (kg/ha)	Fibre diameter (microns)	Lambing (%)
14	4-7	67	19. 9	69

Stocking Rate

The most meaningful time to estimate stocking rate for us is when temperature is at its lowest; late winter. Our present stocking rate at the end of winter is 12.6 DSE/ha which rises during the spring and early summer to approximately 18 DSE/ha because we have spring lambing sheep and spring calving beef cattle.

On our better perennial pasture the sort of stocking rates we are running is 14 ewes/ha. Data from one paddock which was restocked after the drought with 14 ewes/ha straight out of the feed lot when it rained is shown below in Table 1.

Although this shows reasonable production from our better paddocks there is still a lot of room for improvement.

Potential Stocking Rate

There is no simple model to determine potential stocking rate for high rainfall grazing. A model devised by French and Schultz (1984) to determine the potential production of cereals and pasture in dryland cropping areas for any amount of annual rainfall may be useful:

$$\text{Potential stocking rate} = \frac{(\text{annual rainfall} - 250\text{ mm}) \times 1.5}{25}$$

According to this model we have a potential of 30 DSE per hectare. Although this does not allow for run-off or under utilised rainfall during summer months.

At best we have realised only a little over half of this potential. At some time we will know how achievable this potential is and in the meantime it gives a challenging target. Once we have determined the potential stocking rate we can then decide what stocking rate is our optimum. Monitoring the production we have achieved since purchasing the property in 1987, gives some more clues to the potential production (Figure 1).

Environment

There is a common misconception that increasing stocking rates will increase land degradation. This is certainly not the case with the two largest

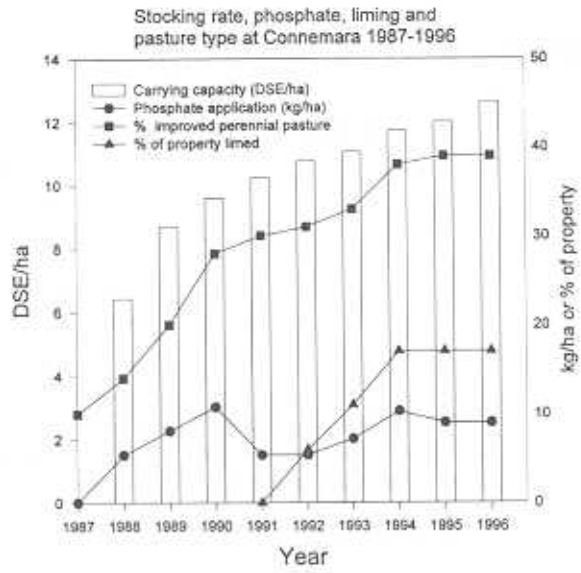

Figure 1. Stocking rate, phosphate, liming and pasture type at Connemara 1987-1996.

degradation problems in the area: soil acidity and salinity.

Well fertilised, highly stocked perennial pasture actively grows through much of the year. These pastures, when kept short during spring, will be active and use water for a longer period than underutilised annual (or perennial) pastures which go rank and die off sooner. With greater water utilisation, accessions to the water table are lower and the potential for salinity is decreased. Also by actively growing for a longer period, heavily stocked perennial pasture will utilise more nitrogen and lower the amount of nitrate leaching which is a primary cause of soil acidification.

Well fertilised, highly stocked perennial pasture can provide sufficient income to enable lime to be applied, thus correcting acidity problems. Low stocking rate, whether on annual or perennial pastures, are unlikely to provide enough income to allow lime to be purchased and applied at a suffici-ent rate to arrest soil acidification in such systems. Higher stocking rates require greater management during drought and stock may have to be feedlotted to prevent erosion once ground cover falls below 70%. Higher phosphate applications could potentially result in greater levels of phosphate run-off. This problem is more determined by rainfall intensity immediately after application (which can-not be predicted or controlled) than any other factor.

So far there is a very good pattern emerging on "Connemara" which reinforces what lots of experimental work has shown over the last few decades. That is, applying lime, sowing perennial pasture and applying high rates of P results in productive past-

ures carrying large numbers of stock producing large quantities of wool and meat.

So why haven't we undertaken more pasture improvement? Lack of profitability.

How to increase profitability?

The most important ingredient in increasing profitability is to have a highly efficient production system. It is essential to have profitable animals and run them at high stocking rates.

We also have to constantly remind ourselves not to spend major time on minor things and conversely minor time on major things. To increase efficiency we have identified weaknesses in our production system and changed them. This change was not always easy.

Time of lambing/calving is critical. We used to spring lamb and autumn calve. Calving was changed to spring to better utilise the spring flush of feed.

We have shorn sheep in almost all months of the year while moving from a late winter to a late summer adult sheep shearing. Hoggets have their first shearing at 14 months in November. This was done to decrease the energy requirements of sheep over the winter and has allowed a higher stocking rate over winter.

We supplementary feed for survival when necessary and have sent cattle on agistment. Feed lotting sheep during the drought was a difficult decision to make, however, once in the feed lot they were easy to manage, efficient to feed, preserved pastures in paddocks, prevented soil erosion and allowed high levels of production to continue once it rained.

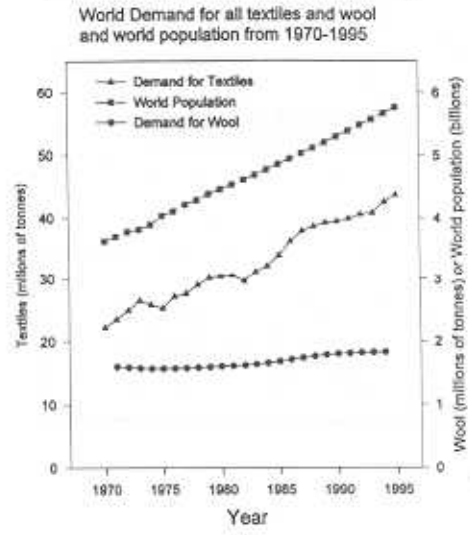

Figure 2. World demand for all textiles and wool and world population 1970-1995 (source: PCI -Fibres and raw materials)

Risk Management

Our major product is fine wool (19.5 micron). Of the major agricultural commodities wool has the greatest price volatility with fine wool being considerably more volatile than other types. This means that we are operating in a very interesting and challenging market with many opportunities and pitfalls. We have learned how to take some of the risk out of the market by selling forward and using options and futures contracts. This has been a very steep learning curve. There is still more refining to do with risk management of wool, although it should simplify marketing and hopefully increase our profitability.

Off farm limits to production

Promotion

The next challenge to increase our profitability is in building demand for our wool. World textile demand is closely related to world population (Figure 2). Between 1970 and 1995 world textile demand has almost doubled. In this same period world demand for wool has risen only by 9%. Obviously the system of demand building we have been using is not efficient.

How can we increase the demand for wool? In every part of our production system, except demand building, we have a choice. A choice of where we locate, the type of sheep, fertiliser company, bank, wool broker, wool options, futures or the spot market, to name a few. All of these choices enable competition and keep the system efficient. With demand building we have no such choice. Instead we have legislation under the tax act which prohibits any choice of the amount we can contribute to demand building or to which organisation/company we would like to promote our wool. A choice of promotion options is essential to enable the rewards of an otherwise efficient production system to be realised.

Monitoring performance

The first step to monitoring is to keep useful records.

We are continually recording and monitoring performance of a wide variety of things such as: soils, rainfall, liveweights, condition scores, internal parasites, sire performance, ewe performance, clip

analysis, daily physical wool prices and basis difference, wool futures and farm financial analysis.

Maintaining momentum through the whole system

We have discovered that it is usually more productive to work on ourselves than on our business. Learning new skills and being willing to change is essential *e.g.* learning how to feedlot sheep, learning about derivatives and understanding enough about nutrition to change the time of shearing and calving. It is all very well to know that you have to change, however nothing is achieved until the change is actually implemented.

We actively seek information and unabashedly copy those ideas which are successful. We have found that those who are most successful are most willing to share their success secrets and like to see other professionals in their field achieve excellence.

A challenge to all of you, is if you want to be a professional in any field, gather more information, have the courage to change and go and implement it.

Conclusion

We can make our pasture-based enterprises more profitable, by spreading more lime, sowing more perennial pastures, increasing P applications and increasing stocking rate of highly productive sheep to match seasonal pasture growth. Our profitability is also dependent on being vigilant in risk management, continuing to seek information and replacing an antiquated system of wool promotion.

Reference

French, R.J and Shultz, J.E. (1984) Water use efficiency of wheat in a Mediterranean environment. *Australian Journal of Agricultural Research* **35**: 734-64