

CONSERVATION FOR PROFIT:

BETTER PASTURE UTILISATION TO PRODUCE QUALITY BEEF

(Don't Abuse it, but Use it or Lose it)

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Abstract. In our complex agricultural systems, solutions to some problems generally create other problems. We have found that improving our property with superphosphate, clover and perennial grasses has not given us the ideal system. Apart from weeds, annual grasses, poor persistence of pastures and the cost-price squeeze, we have found that we have been unable to fully utilise the extra feed grown. Previous experience with fodder crops had shown us the value of extra feed at the right time. However, we were still wasting a large proportion of the expensive feed grown as pastures or crops. We have found that silage is the most cost-effective method for us to transfer excess production from one part of the year to another. This has allowed us to achieve our aim of producing quality beef for the domestic market, as well as satisfying our own economic and social needs.

Merryvale is a 624 ha specialist beef farm near Crookwell on the southern tablelands of NSW. An elevation of almost 1000 metres on top of the Great Dividing Range means a long and cold winter with low pasture growth. The topography is undulating but not steep, and is very open to the elements. Most of the property is arable. The soil type is 90% granite with some basalt, and has a long history of pasture improvement. The farm is operated by parents and son and his wife. We aim to produce quality beef for the domestic market (200 to 220 kg dressed weight), particularly during the winter and early spring months. Most production has gone to local butchers and has been supplied from our own self-replacing breeding herd, plus the purchase of weaners in most years.

Background

If I have learnt anything over the past 40 odd years of farming, it is that the solution to today's problem is nearly always the genesis for two more tomorrow. When I started, what to do in our part of the world was simple. The rabbit problem was solved, so all that had to be done was subdivide, clear the scrub and throw out superphosphate and sub-clover, then wait for the grass to grow. The transformation was a wonder to behold. So were the thistles and the barley grass, together with footrot, pizzle rot, bloat and intestinal worms. What to do next was simple. Use that nitrogen up with crops and perennial grasses (mainly rye grass). As for those other things, well, the scientists had the answers for them with marvellous new drugs.

So what happened? It seemed fine for a while except for poor prices, politicians and the cost-price

squeeze. Added to these we now have soil degradation, acidity, aluminium toxicity, salinity, pastures that don't last more than 3 or 4 years, invasion of less desirable species and drug resistance. See how the problems multiply?

I feel that the best news is that there is no longer a single plan on what to do, but many different approaches that can be taken. The only common ground seems to be a desire to achieve long term, stable pastures with a desirable botanical mix, and so support an optimum animal population with the desired productivity.

To achieve this, many conflicting options have been suggested. Use native pastures or sow introduced species. Use no fertiliser or use lots of fertilisers. Plant native trees (if they can survive the bugs) or exotics. There is a proliferation of grazing management techniques, some of which may be good for pasture management, but difficult to reconcile with some livestock management systems. All these different practices should add much to our future knowledge.

What I have to say is in relation to our situation as beef producers who have taken the option of introduced pastures with the use of fertiliser (mainly superphosphate).

The need for change

Some 3 or 4 years ago we felt that unless we could make some changes to our management we were probably on a one way street to nowhere. The cost/price squeeze was making our farm program which had been successful for 20 years look no longer viable. To

illustrate, a tractor we bought in 1983 took the sale of 93 cattle to pay for it. A tractor with the same capability in 1992 would have required the sale of 156 cattle. Three more complications were also coming with the aging of one family, the education of the other family's children and the need for replacement labour.

In order to produce our product we had been using a rotational system of growing grazing crops (oats) with both short term and long term pastures. Our fodder conservation of hay and what we would now consider poorly-made silage, was little better than a maintenance ration, but still got us out of several tight spots.

Both the costs of cropping and sowing short term pastures were increasing at an alarming rate, much faster than our returns and would soon be leaving us with no margin at all. Some of our long term pastures were reasonable, but using these as our sole feed source would result in either a feast or famine for our cattle. With this wildly fluctuating food supply there was no way we could achieve our production goal. There would be periods of excellent pasture in terms of both quantity and quality followed by quantity and poor quality and then some quality but very insufficient quantity.

Under this system we could no longer guarantee our customers the supply of quality beef, except when it was freely available from everyone else. We would have to change our system to weaner calves for sale prior to winter, maybe steer fattening when conditions allowed, or leave the cattle industry altogether. Because of our limited land area we doubted if the first two options would generate sufficient income, and we do not have the \$1 million our neighbour wants for his place, as land values in our area are around \$2500/ha. While we were OK in the short term, the longer term was not very positive.

We estimate that to maintain and occasionally renew a high performing pasture requires an annual expenditure of \$60/ha, made up of:

- \$25 fertiliser;
- \$11 allowance for lime at 2.5 t/ha every 15 years;
- \$20 allowance for pasture renewal every 10 years; and,
- \$4 general maintenance (weed control, water etc.).

This adds up to a considerable amount of money being used to produce a pasture that we were unable to use at its productive best. So what could we do? Did we have a resource that we were not utilising to its potential? Surprise, surprise! Not really, it was always

there. However, in not using it, we were abusing it and so losing it

Pasture limitations

We contend that gross under stocking/under utilisation of a pasture probably does as much damage as over stocking. It could very well be a major contributor to pasture deterioration through selective over grazing of some species and the build-up of dead material of others. This leads to suppression of regeneration, especially of legumes, resulting in an increase in less desirable plants.

We were investing our money to produce a pasture that our stock could not possibly consume at its productive best and the excess was so high it was destroying itself. Our cattle produced at a tremendous rate for about a quarter of the year. Production then declined rapidly due to low quality and finally either ceased or went into reverse as quantity also became lacking. At the same time, total pasture production actually had the potential to provide year round production at our goal level.

Figures 1 and 2 illustrate this contention. However, they refer only to our property, enterprise and production goal. Figure 1 represents the type of pasture growth per month our \$60 expenditure can be expected to produce in a (non-existent) average year. Figure 2 shows the situation using the above pasture growth pattern and inserting the nutritional requirements needed to achieve our production goal. The nutrition required per month to achieve this goal is represented by the bars while the pasture available to do this is represented by the line. While total pasture production is adequate, the death and decay of the unused spring surplus added to insufficient autumn growth means a severe shortage during winter. If sufficient of the spring surplus could be cost effectively transferred to the winter shortfall with the lowest possible quality loss, then two things would result:

1. Our quality beef goal could be achieved; and,

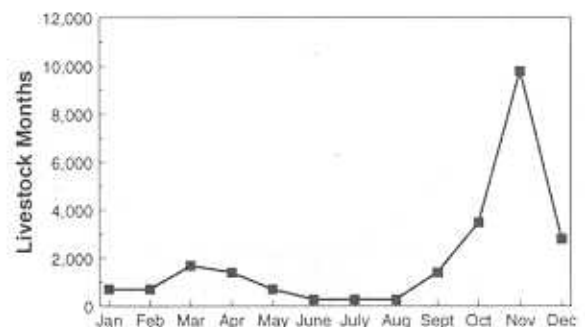


Figure 1. Monthly pasture growth at "Roslyn".

Table 1. Protein, energy and dry matter content of different types of silage.

Type	Protein (%)	Energy (Mj/kg)	Dry matter (%)
Clover/Oats	18.6	10.1	36.0
Ryegrass/Clover	13.2	10.5	38.4
Yorkshire fog	12.0	9.0	44.1

- Our pastures would last longer and be better quality, due to better utilisation.

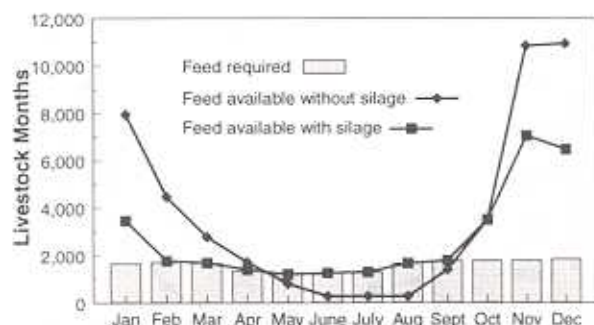
Figure 2 also shows the transfer of the required nutrients to bring the cattle requirements and the nutrients provided into balance. Note that this transfer results in cattle requirements and nutrients provided balancing in February, 2 months earlier, but pasture available is still sufficient until May.

Using silage

In our case, we estimate it is necessary to harvest 20% of our land area. This is not easy, but it can be done. In our location hay is *not* an option. It is too weather sensitive, cannot be cut early enough to be high quality and so its quality is not sufficient to achieve our production goal. Also, the quantity involved would be unrealistic; especially from the storage aspect.

We feel silage (well made) is the most cost-effective method for us to transfer excess production from one part of the year to the periods of low pasture quality and/or growth. In fact, it is at present the only way we can do it in the quantities involved with minimal quality loss. It employs the principles of bulk handling and plenty of low cost storage (both short and long term) by digging pits. Good quality silage is easy to make provided a few simple rules are followed:

- Materials must be wilted to between 30% and 50% dry matter;
- Be processed by a precision cut forage harvester; and,

**Figure 2.** Annual feed requirements and feed available with and without silage supplement.

- Thoroughly compacted and sealed in the pit.

The apparent high cost of machinery involved can be daunting. We have worked with two labour units and two tractors, up to six labour units and six machine units operating at the same time - it depends on scale and speed of operation desired. We have overcome this problem by hiring tractors (preferably with driver), using second-hand machinery and co-operating with a neighbour to do silage for them and combine equipment. The only specialised equipment is the forage harvester and the feed-out wagon. Ours is 25 years old.

Feeding the silage to the cattle is not arduous but is time consuming and requires commitment. The results are rewarding. The type of silage we produce is shown in Table 1. The quality of the silage varies according to its source material. However, in the case of Yorkshire Fog, we have a less desirable, unpalatable species which is avoided by cattle in the pasture unless forced to eat it. It is useless as hay but as silage is readily eaten and has reasonable nutrition. By turning them into silage, pasture-destroying species such as this can be controlled and converted to valuable feed.

Cattle performance

In 1991, our first year with this type of silage, the season was such that our pasture/crop resources were insufficient to supply our customers with quality beef. From experience we knew that hay and grain were not cost-effective, but maybe a silage and grain mixture would be, provided we did not have to use too much grain. My son Andrew contacted Dr. Alan Kaiser at Wagga and with his advice we had the confidence to give it a try in a semi-feedlot type operation.

In order to test the cost-effectiveness of the program we valued the silage at its harvested cost, *ie.* all labour paid wages per hour and all machines operating at contract rates. No value was allowed for the pasture, as unharvested, it would have gone to waste. This resulted in a value of \$35/t of dry matter to ensile to which we added \$15 to feed out, a total value of \$50/t on a dry matter basis.

Weaner steers

Performance of weaner steers is shown in Table 2. While gain/day decreased as % of grain was lowered, the higher the % of silage, the lower the feed cost/kg of gain.

Breeding herd

This silage is adequate to keep a breeding herd near full production when almost entirely dependent on it. Our autumn calving herd last year was joined under very tough conditions resulting in an 89.5%

Table 2. Performance of Weaner Steers 1991-1993.

Year	Ration	Average gain (kg/day)	Feed cost (c/kg gain)
1991	50% silage/50% grain	1.25	71.5
1992	75% silage/25% grain	1.18	65.0
1993 ¹	85% silage/15% grain	1.07	62.0

¹ Lower quality silage used for 4 weeks. This reduced the gain/day for that period to 0.8 kg/day.

pregnancy rate after a 7 week joining. Incidentally, last year we increased the number of calves born by 20% through increasing our cow numbers and we feel confident that under this system this can be maintained.

Benefits to pastures

At this stage there appears to be an unexpected bonus which may be the greatest value of all, and pulls the whole system together. Under our original system we had sown our less arable country to phalaris and clover based pastures. Those based on the Australian type are still reasonably productive even after 20 or more years and cutting them for silage seems to be improving the clover content and controlling yorkshire fog grass. The newer variety of sirosa has been disappointing in its persistence.

We had used a rotation of grazing oat crops followed by perennial rye grass and subclover for 4 or 5 years on our more arable areas. At times we could not achieve our cattle production goal with the grazing oats due to low early growth caused by poor rainfall or attack by what I understand is barley yellow dwarf disease. By cutting our pastures for silage we know ahead whether we have feed or not and so can plan accordingly. As previously mentioned, the increasing cost and partial failure risk were making the viability of the cropping system suspect. We substituted some of the oats with short term rye grasses such as Concord. This

was an improvement in that it was very productive in quality and quantity and, for us, could last for 3 to 4 years.

However, we really wanted a system that allowed us to reach our livestock goal without the continual need for resowing. Four years ago, with the commencement of this silage system, we started replacing the short term pastures with what we hope will fulfil our needs. It is quite a mixture but in order of importance comprises fescue, Australian phalaris, a little perennial rye grass and two varieties of subclover. At this stage we are confident that our pasture composition is improving with a better mixture of grasses and clovers, not only in the harvested areas, but also in the grazed areas due to more utilisation of pasture growth through increased grazing pressure. It is also allowing use to be made of what we considered less desirable grass species and appears to be reducing their prevalence in the pasture, possibly due to the reduction in their seeding capacity.

Other benefits

Those social problems I mentioned at the commencement of this paper now look as if they may be soluble, and the road we are on may lead to a more positive future. The increased production may enable us to employ that much-needed replacement labour.

Conclusion

My past experience leaves me in no doubt that there are unexpected problems waiting in the wings but, in the meantime, providing we are able to maintain the logistics of the program and be committed to the feeding out entailed, we feel this is a system which leads to better pasture utilisation and the production of more quality beef in a cost-effective manner. We are now four years into this program and we hope we can continue to use it without abusing it, and so not lose it.