

FERTILISER OPTIONS:

PUTTING IT ALL TOGETHER - A PRODUCTIVE PERENNIAL PASTURE SYSTEM

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"Quamby", Ararat, Vic 3377

Abstract. "Quamby," is situated 12 kilometres East of Ararat in Western Victoria on the edge of the basalt plains, with an average rainfall of 575mm. Since 1986 wool production has increased from 33 to 60 kg of wool per hectare and stocking rate has increased from 9.5 to 13.5 dry sheep equivalents per hectare (DSE/ha). This lift in production is a result of changing lambing from Autumn to late winter/spring and a pasture improvement program. With a closer match of pasture production to stock requirements, we have achieved a more efficient system of wool production, coupled with an increase in stocking rate as a result of increased pasture production.

Until 1986, we had an all-ewe flock of merinos lambing in the Autumn. The long-term result of this system, apart from poor productivity, was looming drench resistance, pastures largely invaded by annual grasses due to overgrazing in the Autumn, and high supplementary feed costs. In 1988 we decided to improve our production by changing to spring lambing and using productive perennial pastures. Because of extremely high land prices, the option of increasing the size of the property was not feasible. Full details of our property and management system are shown in the Appendix.

When thinking of productive perennial pastures, I believe we need to consider not only the level of fertility in the soil, but the whole farm system. It starts by having good, productive pastures that are managed with the correct fertiliser strategy and pasture management, coupled with productive livestock stocked at the optimum grazing pressure for the whole year.

In general, our system involves higher inputs and therefore greater costs, workload and, in some people's eyes, greater risk. In order to manage a high input system, greater management skills are required, as well as a method of analysis of performance. It is advantageous to have a good recording system of financial records as well as paddock records, so that you can achieve optimum production in order to still be profitable.

High fertility pastures

Soils

Our soils are basalt type with a water pH of 5.2 to 5.9 and Olsen P levels of 12 to 22 ppm. Lime is added at the rate of 2.5 t/ha to reduce aluminium levels in or-

der to plant Siroso and/or Holdfast phalaris. Our rainfall is marginal for perennial ryegrass, so we use phalaris for its drought tolerance. The underground activity is increasing as time goes by, with worms and dung beetles becoming more abundant.

Pasture management.

New pastures are direct drilled in the autumn with Trikkala sub clover (10 kg/ha) and either Siroso/Holdfast phalaris (4 kg/ha) or Ellett ryegrass (6 kg/ha) depending on soil type. We sow into paddocks that have either been spraytopped or cropped with cereals or a summer fodder crop.

Our best pastures are those with an Olsen P level of 18 to 22 and have had lime added. They are grazed in a rotational pattern as required in order to advantage the plants survival. These paddocks are carrying 12 ewes per hectare (18 DSE/ha) or 15 wethers per hectare, and the wool cut from both is nearly 100 kg/ha, a long-term goal of production.

These pastures contain an even mix of Trikkala subclover and perennial grass with very little annual grass. In order to maintain this ideal mix it is necessary to have the pasture grazed down to about 800 kg DM/ha at the time of the autumn break. This allows for a good strike of sub clover after the opening rains.

Pastures are fertilised according to their carrying capacity and soil test results. In building up a pasture we apply 2.5 t/ha of lime and then the equivalent of 250 kg/ha of single super for three years. This system not only increases the level of winter production but, in the late spring/summer, the palatability of dry standing feed is improved, and stock graze the dry pastures much better. As well, there is a large seed bank of Trikkala seed on the ground which the stock graze and

do very well on. These two factors together reduce the need for supplementary feed in the autumn, except in extremely dry years.

Grazing management

The average date of the autumn break at Quamby is the 23rd of April. As a result we can never be assured of adequate pasture growth during early winter to sustain lactating stock without supplementary feeding. For optimum production, it was necessary to adjust our time of lambing to coincide with peak pasture production in spring. The benefits gained by the change are:

- Annual feed costs have dropped from \$7 to \$1 per ewe;
- 15% more ewes can be run on the same area;
- There is a reduced need to drench for worms; and,
- Stock numbers have increased, due to all sheep being dry in winter.

In order to achieve optimum utilization of pasture grown, we set grazing level targets for pasture height at certain times of the year. (see Appendix). The main reason pastures fail is that they are not grazed heavily enough prior to the autumn break. This means that the clover is crowded out, the pasture becomes very grassy, and there is no fixation of nitrogen to boost the pasture along.

Set stocking or continuous grazing can lead to some perennial grasses being grazed out and also lead to weed invasion of annual grasses. Therefore, we rotationally graze similar to what is required for lucerne. We have average mob sizes of 1000 rotating through 3 or 4 20 to 24 hectare paddocks. This means pastures are grazed more evenly, allowing plant reserves to build up. During lambing all paddocks are set stocked.

In January each year it is difficult to believe that the great bulk of dry feed in the paddocks will bare off, but it is remarkable how it has gone by April. The pastures in paddocks that have a low Olsen P level always carry the largest amount of dry feed in late autumn, and these paddocks are the ones where the livestock require supplementary feed first.

We have extended spring in some pastures by cutting hay or silage, and this prevents the pasture from running up to seed and dying off early. The hay aftermath is perfect to put lambs on after weaning and, if late rains fall, then extra feed can be produced.

The livestock

At "Quamby" we have a self replacing merino flock with 40% wethers in the flock. We lamb in August/September for 5 weeks and then wean the lambs

13 weeks from the start of lambing. We aim to have the lamb bodyweights at 26 kg at the end of December in order to reduce the quantity of supplementary feeding they require.

As the pastures are fairly short in winter, it is necessary to monitor stock for worms, and faecal egg counts are done every six weeks after the autumn break. We have found that whilst the pastures are short, the amount of drenching necessary has reduced. Weaners are given selenium capsules at 6 months of age and, whilst blood tests have not given us conclusive results, we have found adequate response to continue using the pellets.

Risk management

Many livestock owners believe that the easiest way to handle a drought is to under-stock (which results in poor clover growth), but this plan does nothing for the soil or profitability, and these properties are often the first ones to crash in a drought.

With high stocking rates there is always the fear of drought, and so it is necessary to have a strategy in mind for it. This may be large quantities of fodder on hand, a willingness to buy in fodder or a plan to sell certain sheep. We always have grain on hand as well as silage and hay, some of which are traded from time to time. Whatever it is, abuse of the soils in the future will not be tolerated by anyone *so be prepared*.

Monitoring and goal setting

We have a computer system for paddock records and this helps to analyse different pasture species for performance as well as deciding on fertiliser requirements. As new products become available there will be a need to trial these products ourselves, and it is necessary to have a system in place that allows us to do it. For each paddock we record:

- Stocking rate;
- Dry matter available at the autumn break;
- Condition score of sheep in July;
- Height of pasture in July;
- All costs (fertiliser, chemicals, etc.); and,
- Any operations (eg. Spraytop/spraygraze).

Through the keeping of records we are able to monitor our progress both financially and physically, and from there set goals. Several years ago I set out to produce 100 kg of wool/ha and, with good pastures, I can achieve this with wethers in some paddocks, but not across the whole farm. Therefore, we have set targets on whole farm basis (eg. 30,000 kg of wool annually). As commodity prices change, so do farm operations and targets may vary, but in general the aim is the same.

Conclusions

To have a profitable perennial pasture system it is necessary to have:

- (1) A good fertiliser strategy and pasture management.
- (2) Correct grazing pressure.

- (3) Productive livestock.
- (4) A system for monitoring, records and targets.
- (5) Strategies in plan for adverse conditions (*ie.* drought).

The benefits are greater profitability and a system that is more in balance with nature. At times the workload will be greater, but your viability will improve.

APPENDIX

Farm Fact Sheet as at 31st March 1994

Farm Size: 520 ha

Leased: 280 ha

Total: 800 ha

Average Rainfall: 575mm

Soils: Basalt soils with red loams to heavy grey clays with stony barriers

| | Pre-Lime | Post-Lime |
|-----------------------|----------|-----------|
| pH _(water) | 5.5 | 6.0 |
| Al (%) | 35 | 4 |
| P (ppm Olsen) | 14 | |
| K (ppm) | 215 | |

Paddocks: 22 paddocks, average size 23 ha

Pasture Types:

- 330 ha phalaris and Trikkala subclover (63%)
- 120 ha perennial rye and Trikkala subclover (24%)
- 22 ha tall fescue and Tahora white clover (4%)
- 40 ha unimproved annual pasture (9%)
- 510 ha Total

Stock Types and Stocking Rate:

- Quamby: 2500 ewes joined to Merino
900 ewes joined to Dorset
1100 weaners
600 wethers
50 rams
Total: 5150 (= 10/ha)
Total DSE: 6900 (= 13.5 DSE/ha)
- Lease: 2120 wethers

Farm Productivity:

| | 1987 | 1993 | Target |
|------------------------|------|------|--------|
| Stocking rate (DSE/ha) | 9.5 | 13.5 | 15 |
| Lambing (%) | 78 | 82 | 100 |
| Wool type (μ) | 20.3 | 20.5 | 20.5 |
| Wool cut (kg/head) | 5.7 | 6.2 | 6.5 |
| Wool cut (kg/ha) | 33.5 | 60.0 | 90.0 |
| Wool price (\$/kg) | 7.26 | 3.0 | |
| Fertiliser (kg P/ha) | 4.5 | 15 | |

Fertiliser Program:

- Soil nutrient targets
Olsen P - 20ppm
Aluminium - <10% (low enough to sow phalaris)
- Annual topdressing
Buildup - 250kg/ha single super annually
Maintenance - 180 kg/ha single super annually
- Lime
12.5% of Farm @ 2.5 t/ha

Grazing Targets:

- Pre-Autumn break - All pastures down to 800 kg DM/ha
- Mid-July - Pasture height 2.5cm
- Late-Spring - Pasture height 10cm

Livestock Growth Targets:

- Lambs at weaning - 23 kg
- Lambs at feed drying off - 26 kg
- Dry sheep in July - Body condition score 2.0-2.5
- Pregnant ewes in July - Body condition score 2.5-3.0