

GRAZING SYSTEMS FOR WEED CONTROL:

WHOLE FARM MANAGEMENT - A PROFITABLE WEED CONTROL SYSTEM

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Abstract. The important steps in long-term farm business planning are identification of problems, formulation of a strategic plan and the setting of short- and long-term goals. Using these steps, I have come to the view that traditional pasture systems on the southern slopes are essentially unsustainable - low fertiliser inputs into an annual grass/clover mix infested with weeds and stocked at a maximum of 8 DSE/ha. I believe we need to "Rebuild the Factory" in the paddock, sowing a strong mix of perennial grasses and clover with adequate fertiliser, with increased stocking rates to utilise the extra feed grown. We have shown that with attention to these factors plus good grazing management, such a system is profitable and sustainable, and serious weeds are kept under control.

The district in which I manage properties is the Boorowa Shire on the Upper Slopes in Southern NSW. The area has an average annual rainfall of 625 mm and an elevation of 480 metres. The countryside is undulating and the predominant soil types are sandy-loams derived from granite. The area we farm is 9000 hectares with paddock sizes ranging from 30-100 hectares.

Our enterprise mix favours livestock with no specific cash cropping. Enterprises include Merino sheep, first and second cross lamb production, an Angus breeding herd, a cattle feedlot and an opportunity lamb feedlot.

During this talk I will refer to improved pasture as a blend of perennial grasses and a subclover base. Most pastures in the Boorowa district at present are subclover-based, infested with annual grasses and an assortment of broadleaf weeds. The major weed in the Boorowa district is commonly known as Scotch Thistle (*Onopordum illyricum*).

Planning

Another title for this paper could well be, "Rebuilding the factory", since elements of the property are essentially components of a manufacturing business. For example, the Paddock is the Factory; Pastures are the Raw Materials; Livestock are the Machines; Meat/Fibre are the Products. There are three important steps to long term farm business planning, namely to identify the problems, formulate a strategic farm plan and to set short and long term goals.

Identify the problems

The common problems that we deal with in the Boorowa district are:

- Acid Soils - pH levels range from 4.0-4.6 (in CaCl₂);
- Dryland Salinity - rising water tables (with positive heads of up to 2 metres) are a rapidly expanding problem;
- Weeds - general broadleaf weeds (especially scotch thistle) have taken a large hold in our area;
- Low Fertility - poor farming practices, particularly on the lighter soils and the breakdown of soil structure by continuous cropping have reduced farm productivity.
- High Farm Overheads - today these are so high that we need to spread them across more production units (*ie.*, more DSE's). In order to run more DSE's you either overstock or grow more feed to carry the higher stocking rates.
- Tree Decline - This is an effect of poor land management and soil degradation and must be addressed in long term planning.
- Sustainability - It is obvious that high rainfall farming is at risk both financially and environmentally unless the arable areas are regrassed with preferred species and managed for long term production.

Low productivity is mainly expressed in the form of low and uneconomic stocking rates. Increased throughput of the factory is essential for profitability.

Strategic farm plan

To "Rebuild the Factory", we have formulated a ten year plan to pasture improve our total arable land using direct-drilling techniques at a rate of 10% of the area per year. Due to the very high invasion of scotch thistle (which has a minimum seed life in the soil of twenty years), we have taken the approach of "instant pasture", that is, one year establishment. This means we do no cropping prior to the establishment year.

The technique we use is outlined in the Prime Pastures Program Field Guide. It is simple and successful, but initially expensive. For this reason we always use a light cover crop which assists cash flow during the establishment year.

Once established, pasture maintenance and live-stock management become essential to the long term sustainability of the system. We feel these aspects are far more difficult to learn and manage than the establishment phase. Increased stocking rates are critical to maximise profitability, because there is no point in spending hundreds of dollars per hectare if stock numbers are not increased to utilise the extra feed. These extra stock must be planned for just as the pasture is planned.

Goals

Management goals: Our main objective is to change a weed infested annual grass paddock to a balanced perennial grass and clover pasture. The ideal mix is 60% grass, 40% clover. A vigorous pasture of this nature should control weeds to less than 1% of the area and allow an increase in stocking rate from a district average of 8 to 15 DSE/ha. We have achieved these increases within two years.

Other goals are to maintain the pH level at 5.0 (in CaCl₂) and phosphorous levels at greater than 20 ppm (Colwell) for maximum pasture growth.

Production goals: We have set long-term production goals based on a stocking rate of 15 dse per hectare, incorporating the specific enterprises that we run. Our production goals are:

- Wool production - over 70 kg/ha
- Merino lambing rates - over 90%
- Cow herd fertility - over 90%
- Yearling steer weight gains - over 400 kg at 14 months

We have not reached these goals as yet, but on our improved paddocks we are so close that I know they are achievable.

Financial goal: Our single aim is to return 10% annually on capital invested.

Establishment

The most important step in a pasture improvement program is the planning and costing of the individual paddocks. We have always attacked the easiest and poorest producing paddocks first. Our ten year plan, in which the total arable area of the property is improved, is a commendable goal, but only if it is affordable.

The next step is to obtain first-class technical advice from people who are conversant with the direct drilling of pastures. A simple outline of all the technical steps of a direct drilling program are in the Prime Pastures Program check list. We have found it is far more sensible to spend an extra \$50/ha and succeed than to save \$50 and fail. Some general establishment costs are:

Seed	\$ 48/ha
Fertiliser	\$ 43/ha
Lime	\$ 62/ha
Chemicals	\$ 50/ha
Spray/Sow	\$ 24/ha
Repairs/maintenance	\$ 5/ha
Total	\$285/ha

Our perennial pasture seed mix is a blend of two phalaris cultivars (Australian and Holdfast), two cocksfoot cultivars (Porto and Currie), three subclover cultivars and white clover. Short-term pastures that include some of the high performance ryegrasses have an integral part to play, especially as finishing paddocks. However, we will not attempt these until we have approximately 50% of our arable area covered with the perennial mix.

Maintenance costs of these newly established pastures are predominantly for topdressing with single super (170 kg/ha every two years, costing \$34/ha/2 years). In the Boorowa district this would be the minimum nutrient requirement for vigorous pasture growth.

We estimate the life of these pastures to be a minimum of 20 years, provided adequate nutrient levels and good grazing management are practised. Although the initial outlay is high, these pastures are increasing the stocking rate from 8 DSE/ha to 15 DSE/ha. This development cost of \$40/DSE is much cheaper than purchasing unimproved or run-down country. The other benefits from dense perennial pastures are a bonus.

Results

The economic results that we have achieved are best described by a comparison between the traditional strategy and a direct-drilled improved pasture strategy.

Table 1. Comparison of fertilized perennial grass system *versus* a traditional system.

	Traditional	\$/ha/year	Improved
<i>Costs:</i>			
Spraying - Chemical	11.50		nil
Spraying - Application	6.00		nil
Fertiliser - 125 kg/ha/4yrs	6.50	170 kg/ha/2yr	17.75
Establishment cost	nil	\$285/20 years	14.25
Extra Livestock	nil	extra 7 DSE/ha	42.00
Total	24.00		74.00
<i>Income:</i>			
Average Gross Margin of \$11/DSE			
Return @ 8 DSE/ha	88.00	@ 15 DSE/ha	165.00
Cover Crop Return	nil	2.7 t/ha @ \$90/cover 20 years	12.00
Total	88.00		177.00
<i>Nett Return:</i>	64.00		103.00
<i>Difference:</i>			39.00
<i>Return on Capital:</i>			53%

The traditional approach is to periodically fertilise an annual grass, subclover and broadleaf weed paddock combined with an annual spraying program to reduce the weeds. Our comparative strategy, utilising perennial pastures, is to topdress bi-annually, with virtually no chemical spraying, and to increase stocking rates to utilise the increased dry matter production. Comparative figures are shown in Table 1. This system is generating more cash each year which makes the continuance of this program more affordable.

Management

Pasture improvement is profitable and sustainable provided the new pasture is correctly managed. This involves the management of the plants and the grazing management of the livestock. Plant management requires regular soil testing to monitor nutrient levels. Regular inputs of phosphorus and sulphur are required to maintain pasture vigour and to maintain the grass and clover balance at a ratio of 60/40.

Plant growth patterns are continually studied and assessed to assure their longevity. Perennial grasses such as phalaris and cocksfoot require annual seed set to replenish root reserves for the typical dry summer/autumn period experienced on the southern

slopes. As well, clover requires the reduction of grass stubble over the summer period for adequate germination in the following autumn. Failure to manage the plants correctly will lead to poor production and shorten lifespan.

The grazing management of perennial grasses is best suited to a flexible, loose rotation system. Higher stocking rates are necessary to utilise the increased dry matter production, but new pastures should ideally be grazed by weaner sheep or cattle for the first twelve months after establishment. Continual assessment of pasture growth and species proportion will assist in the setting of stocking rates. Understocking will lead to grass dominance while overstocking will lead to clover dominance followed by the infestation of annual grasses.

Conclusions

Pasture improvement of high rainfall country is inevitable for sustainability. Present farming systems that are based on annual grasses and use annual grazing crops are expensive and short-term. A whole farm approach is required and long term planning essential. For grazing properties in high rainfall areas to remain viable, rebuilding the pasture factory is essential.