

Upper Barrington pasture improvement

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Introduction

The headwaters of the Gloucester, Barrington, Kerripit and Cobark rivers encompass the Upper Barrington Landcare Group. Renowned as excellent eastern fall grazing country the majority of landholders are established family operated properties with significant credibility in the beef industry. Forty years of pasture improvement on ridge and hill country has provided considerable landholder knowledge and allowed both the area's reputation and capability for beef production to grow.

Our property "Knowla" comprises 2,100 hectares and we are the fourth generation to produce beef cattle on it. It is the home of the Knowla Angus stud and Kholwha Devon stud and as well supports a 700 cow crossbred herd producing heavy steers for the EU export market, Japanese feeder steer market and domestic butcher shop carcasses.

Commitment to industry programmes such as CATTLECARE, Prograze, MSA and EU Accreditation have been standard amongst the majority of the area's landholders. As well, the driving forces in the establishment of the Barrington Beef Marketing group reside in the region.

The introduction of pasture improvement by aerial spraying 20 years ago has produced a new benchmark for beef production in the area. The adoption of this practice has provided beef producers with an opportunity to access markets that carry a price premium, opportunities that would only have been possible on a much reduced scale had previous systems of pasture production still been in place.

The purpose of this paper is to outline the historical and current methods of pasture improvement being used in this area and to point out the economic and environmental benefits available.

Current Pasture Improvement Program

The program of using aerial spraying with glyphosate in the Upper Barrington area commenced in 1986 and has grown to the extent that 15 graziers carried out the program on 1,700 ha in the autumn of 2008. Rates of glyphosate application generally range from 2.5 – 3.5 litres per ha at the water rate of 40 litres per ha. Target weeds include poa tussock (*Poa labillardieri*), bracken, blady grass (*Imperata cylindrical*), dominating paspalum (*Paspalum dilatatum*), carpet (*Axonopus affinis*) and Parramatta grass (*Sporobolus creber*) stands. High quality grazing grasses, legumes and herbs such as rye, clover, cocksfoot, phalaris, fescue and chickory are broadcast by air 4 – 6 weeks after spraying.

After spraying, some producers prefer to burn dense stands of poa and blady grass, but we prefer to maintain as much cover as possible allowing it to create mulch and aid in moisture retention. There is no doubt that a fire assists in the control of tick species, but we have found that spraying on its own is effective in breaking the tick breeding cycle. By controlling the tick population the spray/sow method allows chemical residue risks or withholding periods from alternative tick treatments in stock to be averted.

Where it is possible to work paddocks with farm tractors, minimum tillage methods are used to establish winter cover crops in glyphosate sprayed paddocks. Saia oats, turnips and rape all establish well if harrowed onto sprayed country that had 10 – 20 centimetres of groundcover pre-spraying. We have two standard seed mixes that we use in the development of unimproved country. In the first season a short term mix comprising Saia oats (10 kg/ha), short term ryegrass (Sprinter 12 kg/ha), MPT turnips (1 kg/ha), Haifa white clover (1 kg/ha), USA red clover (1 kg/ha) and Pulsar rape (1 kg/ha) are

broadcast. With good management and average rainfall this will provide two years of fattening feed capable of producing 300 – 400 kilograms of liveweight gain per hectare. In the third year a longer term pasture mix is applied comprising fescue (Festival – 8 kg/ha), cocksfoot (Porto – 2 kg/ha, Greenly – 2 kg/ha), prairie grass (Matua – 2 kg/ha), Haifa white clover (1 kg/ha), USA red clover (1 kg/ha), Woogenellup sub clover (1 kg/ha) and chicory (Punter – 1 kg/ha). Some of the species we use are not as high performing as alternatives on the market, but have proven themselves capable of establishment under our conditions. Over the longer term this country will consistently produce over 200 kg liveweight per hectare whereas in its unimproved state it would have been producing between 50 and 100 kg liveweight per hectare.

Since the inception of these ‘spray/sow’ and minimum tillage techniques in the Upper Barrington area there have been no examples of erosion and/or landslides attributed to these methods of pasture improvement.

The early autumn 2001 program gives substance to this argument. Over 600 hectares were sprayed in the first week of January followed by four dry weeks with abnormally high temperatures recorded. On 31 January the weather pattern changed and in the ensuing eight weeks between 600 and 650 mm of rain fell. The annual average for the area is 950 mm. During this period a one in 20 year flood was recorded in the Barrington River with bridges washed away and landslides common cutting roads regularly. Inspection of the above-mentioned 600 hectares subjected to these conditions shows no runoff or landslide impact whatsoever. Again in this past autumn we had two rain events in excess of 250 mm within 6 weeks of spraying with no visible undesirable impact apparent.

In isolated cases, due caution to wind conditions must be observed to avoid spray drift defoliating mature native trees which are then susceptible to damage by any subsequent fire. Where possible we spray under trees with a ground rig to avoid the possibility of drift damage.

Historical Pasture Improvement Programs

Prior to the development of the aerial ‘spray-sow’ program in this area there were four basic methods of pasture enhancement widely used. These have all but ceased as management practices. They were:

- ring barking
- Tordon axing
- bulldozing
- multi pass ploughing.

In the Upper Barrington area less than 100 hectares would now be developed using these traditional methods.

This shift away from ploughing and dozing has allowed a noticeable resurgence in stands of valuable native grasses such as microlaena (*Microlaena stipoides*), glycine (*Glycine* spp.) and kangaroo grass (*Themeda australis*). The seeding pattern of these natives stimulates aggressive regeneration when aerially sprayed.

In addition, the use of fire as a hazard reduction management tool has reduced dramatically as improved pastures sown by air do not require burning and are not fire hazards. Likewise the practice of burning for ‘green-pick’ grazing, particularly in blady grass country, is on the decline. As these practices have diminished so erosion risk has decreased dramatically, enhancing the water quality of rivers and streams in the area. This is also illustrated by a reduction in the impact of cattle tracks on terrace setting under established spray sown improved pasture.

Another advantage of reducing the dependence on fire as a grazing management tool is that as you retain mulch there appears to be a trend towards increasing soil carbon levels. This in turn enhances the ability of the soil to increase water carrying capacity.

The Economic Benefit

A 1993 paper* by the NSW Department of Agriculture demonstrated return on capital of 86% on a 150 ha paddock spray/sown at Moppy. This is a result of increased carrying capacity and

faster weight gains from the improved pastures. Any analysis of 2008 benefits would match that figure with livestock prices in many of the intervening years producing an even better result.

A typical 2008 cost per hectare, for aerially spray-sown pasture is:

Helicopter spraying	\$41.50 (Precision Helicopters)
Chemical	\$18.00 (3 litres glyphosate CT)
Pasture Seed	\$110.00 (20kg & \$5.50 kg)
Helicopter seeding	\$41.50 (Precision Helicopters)
Fertiliser	\$74.00 (125 kg @ \$600 per tonne)
TOTAL	\$285.00 per hectare

Annual Gross return to Upper Barrington graziers per hectare

Production value pre pasture improvement
0.6 steers @ 120 kg @ \$1.80 per kg - \$129.60

Production value post pasture improvement
1.2 steers @ 260 kg @ \$2.15 per kg - \$670.80

Production value gain per hectare
\$670.80 - \$129.60 = \$541.20

Improvement cost per hectare \$285

Net return per hectare \$541.20 - \$285 = \$256.20

Aerial seeding by plane reduces the seeding cost to approx \$12 per hectare but is best utilised on larger areas of 40 hectares or more. Similarly on flatter areas ground rigs will both reduce spraying and seeding costs.

In the early 1990s our property was producing just less than 100 kilograms of liveweight per hectare and whilst there still is a significant area of the property that remains relatively unimproved, the average is now 150 kilograms liveweight per hectare. There has also been a significant benefit to local business houses and the community. Total expenditure by Upper Barrington graziers

on their 2008 pasture improvement program is estimated to be \$484,000. This together with gross grazier returns shown above contributes significantly to the community through greater cash flows, profits and employment.

Summary

Clearly the spray/sow option has a marked influence on the viability of not only our operation but also many Upper Barrington grazing properties. It has allowed many areas not suited to more conventional pasture improvement methods to become highly improved and productive pasture stands. It goes without saying that profitable grazing operations will have better established pastures reducing nutrient run-off and weed infestations, increasing biodiversity and improved soil health.

The economic benefit of aerial spray sow pasture improvement is easily measured as presented. What is not as easily documented but just as apparent to us is the environmental benefits of this option over traditional methods of pasture establishment.

* Davies, Blackwood 1993.

Farm snapshot

Total area – 2,100 hectares

Beef cattle

Angus and Devon studs

700 heavy crossbred steers

Pasture improvement

Aerial spraying of native pastures using glyphosate.

Aerial sowing of improved species.

Use of minimum tillage for forage crops.

Benefits

Resurgence of valuable native species

Increase of 50% in livestock turned off

Increased expenditure in community

Decrease in erosion and improved soil health