Utilisation of pastures dominated by Coolatai grass (*Hyparrhenia hirta*) in northern NSW.

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Summary

Coolatai grass is a persistent introduced grazing species, providing an abundance of moderate quality fodder through spring, summer and autumn. This paper deals with the history of its introduction and a practical approach to the utilisation of this grass as the main fodder source for beef cattle. The major issue to overcome is the decline in nutritional value of the grass-during the onset of winter. Various supplement options to address this decline are discussed.

Introduction

The Little Oxford Dictionary definition of a weed is "*a herbaceous plant not valued for use or beauty and growing wild or rank*". I do not feel that Coolatai grass is a weed. Far from being of no use, it is the mainstay of our successful and viable cattle breeding and finishing enterprise. Although an internet search for articles on this grass will only yield references to "*invasive environmental weed*" and "*threats to biodiversity and endangered ecological communities*", I do not believe this truly represents its potential as an abundant and prolific grazing resource. It only reflects the imbalance in the agenda of those in the community who have the time and funding to publish. The fact that Coolatai grass has established in the grazing land of all mainland Australian states (Sharp and Simon 2002), has resulted as much from the enterprise of our forefathers, as it has from the invasiveness of this so-called "*environmental weed*". It is time to accept that this grass is here and there is very little we can economically do about it, so let us recognise its limitations and learn to get on and use its strengths.

A historical perspective

In an effort to improve poor quality native pastures, Coolatai grass was introduced from the Mundubbera district in Central Queensland, to 'Coolootai Station' by William Henry Walker. Between 1878 and his death in 1900 he managed four properties including 'Coolootai Station' for Thomas Walker of 'Yaralla' Concord. Coolatai grass was established on 'Coolootai Station' by the 1890s. His son, also Thomas Walker, took over as manager following his father's death and continued to actively spread Coolatai grass seed as he rode around the station. Coolatai grass had earlier been introduced to Central Queensland from South Africa. (Walker family 'Coolootai Station' Coolatai, NSW, pers. comm.).

In 1900 'Coolootai Station' was a holding of over 200,000 acres. Our property 'Pine View', along with several others was resumed from 'Coolootai Station' in 1902. When my grandfather, William Hunt, purchased 'Pine View' in 1949, Coolatai grass was established in pockets all over the light sandy ridges and black basalt hills. At this time he intended to run 2000 ewes and 1000 wethers and a few trade cattle from time to time. He quickly realised that 2000 ewes and his few cattle were enough without the wethers. I estimate 'Pine View' carried about 3360 dry sheep equivalents (DSE) at this time. Red clay soils, virgin and previously cultivated, are still dominated by Red grass (*Bothriochloa macra*) and Umbrella grass (*Enteropogon acicularis*) to this day, and alluvial flood plains, although cultivated, grow predominately Pitted Blue grass (*Bothriochloa decipiens*) when rotated to pasture. Cultivation now occupies most of these two soil types on the property.

The areas dominated by Coolatai grass had previously grown Wire grass (*Aristida* spp.) and Spear grass (*Austrostipa* spp.), which produced a moderate quantity of poor to medium quality fodder. The introduction of Coolatai grass saw an overall improvement, producing large quantities of moderate quality fodder and a considerable improvement in palatability. Coolatai grass introduction also alleviated the problem of grass seed contamination in sheepskins, which was prevalent at the time. This is a testament to the foresight of these early land managers.

By the 1965 drought 'Pine View' was run as a sheep and wool production enterprise with Dorset and Poll Dorset studs and a small self-replacing Hereford cattle herd. About 2000 ewes were being run with about 40 cows and progeny, carrying an estimated 3700 DSE. Only about 600 ewes survived the drought and the flock was not rebuilt. All sheep operations were disbanded and the farming and cattle breeding

enterprises expanded, when management was taken over by my father, Bruce Hunt, in 1969. At this time 'Pine View' carried about 180 cows and progeny, carrying an estimated 3200 DSE.

Outline of production on 'Pine View'

'Pine View' is 1207 ha, of which 450 ha are cultivated for grain crops, improved pasture and irrigated/dry land hay production. The remainder grows native grass pasture improved with introduced grass and legumes. The property is run as a self-replacing beef breeding and finishing operation, producing Angus cross steers and heifers for domestic slaughter or backgrounding as domestic feeders depending on the markets. Yearling cattle are crop fattened on oats or grain fattened in an opportunity feedlot on farm, depending on seasonal conditions.

Breeding stock are run in large paddocks at stocking rates of 21 to 30 DSE/ha, for most of the year. Average carrying capacity since 1999 has been 7970 DSE. This is sufficient to achieve nearly total consumption of available mature Coolatai grass during winter months. By the end of winter, paddocks contain only isolated tufts ready for fresh growth in the spring. The benefits of subdividing paddocks into smaller areas is recognised but has been limited by availability of water points. This has been addressed this season by the installation of a solar submersible bore pump to pipe water to troughs in subdivided paddocks in future. Burning and slashing are not used routinely in the pasture system. Burning has a place when bringing long-term ungrazed areas into production but has a detrimental effect on the maintenance of the litter layer and plant vigour if performed repeatedly. Slashing is impractical on the stony and timbered terrain.

Benefits of Coolatai grass as a grazing resource

The most outstanding feature of Coolatai grass as a pasture species is its ability to persist through prolonged periods of drought and to quickly emerge from the butts after the break ready to resume production. As our climate tends to more protracted periods of dry, broken by short intense periods of heavy rain, this trait will become even more important. Even under heavy grazing Coolatai grass contributes to the mulch layer protecting soil from exposure to rain impact and aiding infiltration of soil moisture (McCormick and Lodge 2001).

After the break in a dry spell, mature stems of Coolatai grass have the ability to green up from the base to the top even if they appeared fully cured when the rain comes. Rank grass stems do not share this trait so grazing is managed to ensure that most mature stems are grazed once per season. This is achieved with short periods at high stocking rates to minimise stress on the stock.

Although Coolatai grass becomes quite dormant in the dead of winter, it does grow abundantly through spring, summer and autumn if the season provides at least a modest amount of rain. Stocking rates must be maintained high enough to contain growth during the long growing season but not so high that feed supplies become insufficient during winter. This is perhaps the most challenging aspect of managing this grazing system. In other enterprises taking on agistment stock during the growing season may achieve the required stocking rates without putting so much pressure on winter feed management. Although we have never taken this approach, other local producers have taken on agistment to supplement their own stock numbers.

Limitations to production on Coolatai grass pastures

As Coolatai grass matures in the winter months protein levels are insufficient to maintain production in beef breeders. Supplementation with soluble nitrogen to feed rumen microbes and protein for growth is essential to limit declining condition of breeders during winter (Leng 1986).

A dry supplement containing urea and ammonium sulfate is provided to boost rumen ammonia availability (Table 1). Copper deficiency has been identified as a problem, so copper sulfate is also included in the supplement. Since many of the losses associated with feeding high concentration urea supplements occur during the break-in stage, the supplement is made available to all cattle on 'Pine View' ad-lib, year round. Any supplement containing urea has the potential to cause poisoning so caution must be exercised particularly during the introduction period. During break-in periods salt must be fed initially, followed by small increases in the supplement proportion over two to three weeks to prevent poisoning. Although target intakes of urea recommended in drought feeding guides (eg Leng 1986) have been used as a guide in formulating the supplement, intake varies during the year depending on rainfall and pasture growth. Intake during spring and summer months in good seasons is negligible. As the season deteriorates or winter approaches, supplement consumption increases. Dry supplement is mixed on-farm to reduce cost to about $500 per tonne and last year cost $9.10 per cow/calf unit.

Dry supplement is fed in open troughs, tilted to allow drainage. A drain-hole provided on the lower side must be maintained so that free water cannot build up

Table 1 Dry supplement used on 'Pine View', Coolatai for cattle grazing Coolatai grass pastures during winter.

Ingredient	Ingredient in supplement (%)	Ingredient (kg) per tonne of supplement	Supplier	Supplier phone number
Salt	55	550	Olsen Pacific Salt	02 9632 0441
Bentonite	2	20	JNJ Resources	07 5467 3200
Urea	28	280	Incitec Pivot	1800 333 197
DiCalPhos	10	100	World Search Brisbane	07 3876 2200
Rumigro	0.8	8	Adisseo Australia	07 3271 1244
Gran Am	4	40	Incitec Pivot	1800 333 197
Copper sulphate	0.2	2	World Search Brisbane	07 3876 2200

Note: Urea supplements must be used with caution as stock poisoning may occur

in the trough. Drainage on the ground must also be maintained to prevent pooling of any liquid from the trough. Roofing of troughs has been provided without success, because rain blows from the drip-line into the trough during storms.

Lick blocks with up to 30% urea have been used in the past, but have unacceptably limited urea intake and increased cost. Also the depression in partly used blocks must be drained after rain to prevent poisoning.

Cows are supplemented with up to 1.0 kg/day of white cottonseed to provide protein and energy during the harshest part of winter, coinciding with early lactation for the majority of the breeders. This supplementation last year cost $28.20 per cow/calf unit. Lucerne or oaten hay produced on-farm is also provided at this time.

Coolatai grass hay

Local producers without ready access to surplus fodder for haymaking during the growing season make Coolatai grass hay at full flower stage, while seed heads are sticky. This operation is undertaken by round baling at field moisture directly behind the mower-conditioner. The resulting bales have a sticky skin, something like wrapped silage, and are of acceptable quality. Baling must take place as soon as the sticky seed stage is reached as fodder quality drops sharply from that point on. I have baled grass at this stage for neighbours who stacked the bales closely and covered them with silage pit plastic. Currently hay made this way is baled with net wrap and stored in the open until fed. This haymaking effort demonstrates that the need for winter supplementation is well recognised.

Coolatai grass pasture improvement

Aerial application of single superphosphate was commenced four years ago on most of the unimproved area, at a rate of 125 kg/ha for the first two years. Arrow-leaf clover was also sown and showed great promise initially but has been disappointing in recent tough seasons. Goldphos 20 was spread at 125 kg/ha (approximately equal to 250 kg/ha superphosphate) in subsequent years to better address the phosphorus deficiency and achieve more economical freight and spreading. "Wynn" round-leafed cassia has shown great promise on the lighter soils during the same period.

Limited amounts of production data have been recorded since 1999. These have been converted to yearling weights to assess the benefit of the fertiliser program, showing a fairly obvious lift in yearling weight as a result of pasture improvement, rather than following the seasonal trend (Figure 1).

Although establishment of introduced legumes, without increased fertility, has been generally disappointing over the last twenty years, with exception of the two species mentioned, the response of the pre-existing native legumes to the fertiliser program has been quite outstanding. Silky Glycine (*Glycine canescens*) and Rusty Glycine (*Glycine tomentella*) have both shown response, having been previously disregarded as insignificant herbage. They now grow large fleshy leaves and stems very similar to their near relative, the Soybean (*Glycine max*), climbing up Coolatai grass tussocks and forming a legume/grass blend which is more palatable to the stock than grass alone. Birdsville Indigo (*Indigofera dominii*) has shown similar response, forming dense low growth, particularly on red sandy soils. The native legumes already established, are sufficient to justify a fertiliser program even without introduced legumes.

Conclusion

If we accept the reality that Coolatai grass has replaced some native grasses in the pasture system and also acknowledge that there are native grass

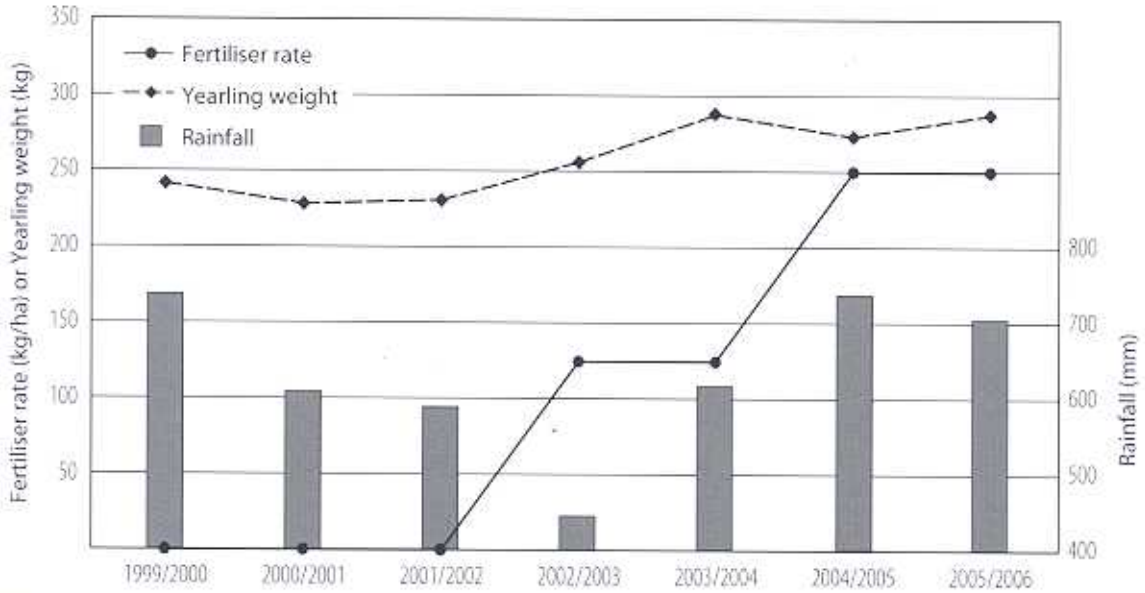

Figure 1 Annual rainfall (mm), fertiliser application rate (kg/ha) and yearling weight (kg) at 'Pine View', Coolatai from 1999-2006.

species it has not replaced, we can then deal with the seasonal nutritional decline so there is no impediment to making productive use of Coolatai grass for beef production. Recognising and dealing with the limitations of Coolatai grass as a grazing species is much more effective use of available effort and resources than continuing the expensive and futile attempts to eradicate it where it has already become fully established.

References

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