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PROCEEDINGS

BEAUDESERT FIELD MEETING, NOVEMBER 23, 1984

The Annual Meeting of the Tropical Grassland Society for 1984 was held on 23rd November in conjunction with a field meeting to visit several properties in the Beaudesert area.

The meeting assembled in the morning at the property of Mr W. Heck and Son, Undullah, to inspect an old species testing site of the Department of Primary Industries and a recently established 160 ha paddock of Callide Rhodes/Siratro/Lotononis. The afternoon program was held on "The Overflow" property of TGS President, Mr Michael Joyce, where pastures and turf farming were viewed.

BEEF CATTLE PASTURES, UNDULLAH

A. MACDONALD

Property Manager, W. Heck and Son

The property in the hills west of Beaudesert comprises 3800 ha and runs 1400-1500 head of Brahman cross cattle and a stud bull herd. Bullocks are bred and fattened on the property. Development of improved pasture has reduced the age of sale from 4-year olds to 3-year olds running at about 730 kg per head.

OLD EXPERIMENTAL SITE

K. F. LOWE

Department of Primary Industries, Ipswich

This experimental site was established in the early 1970s to evaluate the potential of a number of grasses and legumes for cattle in the Moreton Region, especially on the infertile duplex soils represented here. The experiment was sown in 1971 and ran for 5 years. The grasses tested were: Callide, Pioneer and Katambora Rhodes grass, Kazungula setaria, Biloela, Tarrewinabar and Gayndah buffel, pangola grass, green and Gatton panic, and *Panicum maximum* cv. Sabi and Q14374. Legumes evaluated were: Siratro, Lotononis, Archer axillaris, Cook and Endeavour annual stylo, and Oxley fine stem stylo.

Each grass was sown with Siratro as the companion legume or with two applications of 56 kg nitrogen per hectare per year. Molybdenised superphosphate at the rate of 500 kg ha^{-1} was applied at planting and 250 kg ha^{-1} of super was applied annually. Potassium was also deficient and was applied as a biennial dressing of 125 kg ha^{-1} of muriate of potash in spring. Plots were harvested by mowing a swath 0.9 m $\times$ 2.4 m from each treatment. Once the area had been sampled, cattle grazed the excess material. Sampling over the growing season was done twice per year at approximately 12 weekly intervals.

Rainfall was above average in all years of the experiment and generally moisture only restricted pasture growth for short periods during all five growing seasons.

Callide Rhodes grass gave consistently high yields in all years, both in combination with Siratro and in response to the application of nitrogen fertilizer. Dry matter yield of pangola and Kazungula grass improved throughout the period, but all other grass cultivars showed a general decline in both plant yield and population. *P. maximum* Q14374, a very stemmy grass, gave equivalent yields to Callide in most years but it was consistently not consumed by cattle when the plots were opened for grazing after each sampling. Green panic and Gatton panic maintained satisfactory yields for the first two to three years but the yields dropped as they lost population. All grasses showed a decline in yield in the very wet 1974 season. Pangola performed best at this time. Kazungula setaria, *P. maximum* Q14374, pangola, and Callide and Katambora Rhodes grasses were the more responsive species to nitrogen.

The outstanding grasses in the trial were Callide Rhodes and pangola. Now, eight years after the trial ended we can see that only pangola has persisted really well and spread out widely from its original plot. Callide was prominent until 1983, but has declined rapidly since then. The only problem with the adaptation of pangola commercially is the difficulty of establishing it from runners. The results of this old trial provided the impetus for the popularity of Callide Rhodes which is now the most widely used grass in this district.

Siratro was the best legume under the lenient cutting and grazing regime of the trial. Lotononis was the only other legume to have persisted in this environment. It appears to have gone from strength to strength in this situation especially once the grazing pressure on it was increased after the trial finished and the area was used as a farm pasture. The unreliability of its production under all conditions still worries me and I feel that it is still a legume I would recommend in association with another legume and not on its own. The annual stylos did not do well and I believe they are unsuited to this region because they do not seed early enough to build up a good seed reserve. Oxley stylo is suited to some regions in this southern part of Queensland.

NEW GRASS/LEGUME PASTURE

A. MacDonald

Manager, W. Heck and Son

This pasture won first prize in the 1984 Beaudesert Show sown pasture competition. Sown in 1982 with Callide Rhodes, green panic and siratro, each at 2 kg ha^{-1} and Lotononis at 0.2 kg ha^{-1}, the pasture won the prize because of its increased productivity over the natural country. Green panic was included in the mixture to give better first year production but has not lasted well into the second year because the soil nitrogen levels are too low. Only on some of the alluvial creek flats can green panic now be seen in any quantity. The legumes and Callide Rhodes have grown well and overall pasture production has improved each year. No cattle were put on the pasture until all species had seeded in the first year. We believe this is an important aspect of management.

The soil in the paddock is poor, it is a shallow duplex over heavy yellow clay. The soil is acid, infertile and wets and dries rapidly. Five bags of Superking per hectare were given at sowing and another 5 bags will be applied now in the third year. Cost of establishing the pasture for seed and fertilizer was about $120 per hectare.

Before improvement this paddock turned off 60 bullocks per year. The pasture has greatly improved on this production and in the first year gave 57 fat cows and 112 bullocks. Currently the stocking rate is conservative at just under 0.4 beasts ha^{-1}.

The pasture at present has good quantities of both lotononis and siratro.

However, general discussion on management of the pasture emphasized the better prospects for survival of lotononis in the long term because of its resistance to heavy stocking which is sure to occur at some time following a sequence of dry periods. Siratro is favoured by lighter stocking rates and experience in the Beaudesert area shows that if properly managed it can be maintained in pastures for up to 25 years. This has been achieved by spelling it during the flowering period perhaps one year in every five, so that it can seed heavily and build up a bank of seed reserves in the soil. This reserve provides replacement plants for those lost through heavy grazing.

ECONOMICS OF THE PASTURE

L. CLARK
Economic Services Branch, DPI, Ipswich

Costs and returns analyses of the above pasture used for beef production are as follows:

1. *Inputs per hectare*
   (i) Establishment:
   Seed — Callide Rhodes 2 kg
   — green panic 2 kg
   — siratro 2 kg
   — lotononis 0.2 kg
   \$125 ha^{-1}
   Fertilizer—Superking 250 kg
   Tractor F.O.R.M. (fuel, oil, repairs and maintenance)
   — 2 × off-set discings
   — 1 × fertilizer application
   — 1 × planting
   \$20 ha^{-1}
   (ii) Annual:
   Fertilizer—super 250 kg—\$47 ha^{-1} (applied by aircraft)

2. *Beef production assumptions*
   (i) Pasture:
   (a) Native pasture—stocking rate = 3 ha $beast^{-1}$
   Native pasture—liveweight gain per beast = 105 kg yr^{-1}
   Native pasture—liveweight gain per hectare = 35 kg yr^{-1}
   (b) Improved pasture—stocking rates of 2.0, 1.4 or 1.0 ha $beast^{-1}$
   Improved pasture—liveweight gain per beast = 180 kg yr^{-1} (all three stocking rates)
   Improved pasture—liveweight gain per hectare = 90, 130 or 180 kg yr^{-1}
   Extra liveweight gain over native pasture = 55, 95 or 145 kg ha^{-1} yr^{-1}
   (ii) Beef prices
   Costs and returns calculated for three levels of beef prices, viz. 70, 80 or 90 cents kg^{-1} liveweight.
   (N.B. The gain in weight only is valued, assuming no change in the beef price for the animal over the fattening period.)

3. *Economic analysis*
   (i) Cash flow example:
   Assumptions —beef price is 90 cents/kg liveweight
   —extra liveweight gain from improved pasture is 55 kg ha^{-1} yr^{-1}
   —pasture life is 8 years from establishment

Year	0	1	2	3	4	5	6	7	8
					$ per hectare				
Return (55 kg @ 90c kg^{-1})	—	—	49.50	49.50	49.50	49.50	49.50	49.50	49.50
Establishment cost	145								
Annual fertilizer cost	—	0	47	47	47	47	47	47	47
Net cash flow	−145	0	+2.50	+2.50	+2.50	+2.50	+2.50	+2.50	+2.50

(ii) Results—Annual Costs and Returns:
These are tabulated for three stocking rates (see section 2) and three beef prices.

Stocking rate:	2 ha/beast			1.4 ha/beast			1 ha/beast		
Beef price (cents/kg)	70	80	90	70	80	90	70	80	90
Return for years 2–8 ($/ha)	38.50	44.00	49.50	66.50	76.00	85.50	101.50	116.00	130.50
Net cash flow years 2–8 ($/ha)	−8.50	−3.00	−2.50	19.50	29.00	38.50	54.50	69.00	83.50
Net present value ($/ha)*	−ve	−ve	−ve	−ve	−ve	7.00	96.21	160.38	224.56
Internal rate of return (%)	−ve	−ve	−ve	−ve	4.0	11.3	23.5	30.8	37.4

* Interest rate 10%.

4. *Conclusions*

A stocking rate of between 1.0 and 1.4 ha beast^{-1} is required for the investment in improved pastures to pay (under assumptions used). Obviously, for higher beef prices a lighter stocking rate would show adequate returns.

Note the above analysis:

(a) assumed that existing property labour can handle the development.
(b) does not examine the consequences on the whole property e.g. reduction in turnoff age, ability to carry more breeders, etc.
(c) does not allow for any return in the first year. In fact a light grazing would be used.

Ultimately, the viability of the development will depend on the ability of the pasture to persist for 7 to 8 years under stocking rates approaching 1 beast ha^{-1}. Some doubt has been expressed as to whether such high long term stocking rates are possible on improved pasture in this type of low fertility forest country.

LOTONONIS/BLUE COUCH PASTURE

M. B. JOYCE
"The Overflow", Beaudesert

This 16-year old Lotononis pasture was sown in 1968 and has proven very successful over the years since then. The area is rolling, sandstone country with well-drained sandy soils low in nitrogen and phosphorus but high in potash. The paddock before sowing had heavy Acacia regrowth which was pulled, windrowed and burnt.

The original sowing was a mixture of the legumes Lotononis, siratro and white clover, and the grasses green panic, scrobic paspalum and molasses grass. The only sown species left in any amount is Lotononis which is flourishing despite years of hard

grazing and numerous fires. Blue couch has replaced all the sown grasses. The pasture has always been stocked heavily and has had only two short spells of destocking for two months over the 16 years. The pasture received Mo super at 500 kg ha^{-1} at sowing, and 250 kg ha^{-1} in 1970 and 1972, but has not been fertilized since then. The pasture will be fertilized with super this year.

Lotononis growth has been good in all years with adequate rainfall, it provides good feed in spring and in late summer but not quite so good in mid-summer. The pasture turns off fat cattle at $2\frac{1}{2}$ years of age and has doubled the carrying capacity of the paddock without increasing the cost per beast area. The cattle gain weight well all summer and do not lose weight in winter. The pasture is in good condition with high soil seed reserves of Lotononis of 7000 seeds m^{-2} where we are now and up to 30000 m^{-2} on another area nearby. There has been some spread of Lotononis to the rest of the property.

TURF FARMING

E. SMITH

"The Overflow", Beaudesert

The rolling hills, with deep, sandy soils are well suited to turf farming. The area here used to be speargrass and green couch, but is now almost pure blue couch which we believe spread from the old tennis court. Turf farming is an intensive operation, in which we manage two cuts per year but could increase to three cuts if necessary. The area is irrigated weekly, mown 2-3 times per week, and given 16-20 bags of fertilizer per hectare per cut.

A specialized cutter/roller machine and a pallet loading system were demonstrated.

PESTS AND DISEASES OF TURF

I. K. HUGHES

DPI, Entomology and Plant Pathology Branch, Indooroopilly

The meeting was given a short but thorough description of the many turf diseases and pests, and their remedies. This information was summarized in a several page handout which is available from the Department of Primary Industries on request.

The field meeting concluded with a vote of thanks from Mr Robert Harrison to the property owners, speakers, and those who provided four-wheel transport.

The A.G.M. and an evening barbeque followed the field meeting. The retiring President, Mr Michael Joyce gave an address "From Progress to Poverty".

BOOK REVIEW

Nitrogen Cycling in Ecosystems of Latin America and the Caribbean. Editors G. P. Robertson, R. Herrera and T. Rosswall. Martinus Nijhoff/Fr. E. Junk Publishers. The Hague, Boston and London, 1982. 430 pp. Price N/A

Generally biological experimentation is confined to a small part of a larger ecosystem. There is considerable merit in bringing together a large number of scientists, who have as their general interest nitrogen transformations in biological systems, to obtain some consensus on the state of the art in quantifying nitrogen cycling at the level of an ecosystem.