SIRATRO ON SOFT-WOOD SCRUB SOILS

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Introduction

'Hayleigh' is situated in hilly country at Dallarnil in the Biggenden Shire (25° 22'S; 152°04'E) and is managed as a family unit. The property has been in our possession since my youth when the average farm size in this locality including our own was about 70 ha. We now manage 1495 ha of which 1305 has freehold and 190 ha leasehold.

Climate

Average rainfall for Dallarnil is 866 mm with 45% falling in summer, 20% in autumn, 14% in winter and 21% in spring. Frosts are common on the flats and lower slopes with the 1976 winter being particularly severe.

Property Description

The farm straddles two distinct geological formations, namely the 'Broomfield Granites' and the 'Biggenden Beds'.

The granite soils carry mainly open eucalypt forest although thickets of supple jack are to be found and black wattle is common in the area. Soft wood scrub dominated the Biggenden beds with patches of brigalow on the heavier clay soils. A transitional zone between the major geological formations carries eucalypt forest which is dominated by spotted gum.

Three main soil types are found on 'Hayleigh' with the scrub soils being the most productive. Typically the scrub soils are brown or red clay loams over a yellow or mottled clay at 45 cm. These soils have been cultivated extensively since settlement, commencing with sugar cane production in the early 1900's. A typical soil analysis is pH 6.0, ppm P (BSES) 25, Rep K me% 0.35.

The soils of the transitional area between the scrub and granitic sands are generally grey or red brown loams with some shale to 25 cm and then a red or yellow mottled clay. The ridge tops are often very stony with fine loams over brown silty clays near the surface.

The Broomfield granites are infertile grey fine to coarse sands to 30 cm, then a coarse white sand to 60 cm overlaying a mottled yellow clay and decomposing parent material. Soil analysis carried out by Department of Primary Industries, on a development site near one of our paddocks on this soil type is pH 6.0, ppm P (BSES) 5, Rep K me% 0.08.

Approximately one third of our property consists of scrub lands with the rest forest.

Freehold	Scrub	316 ha
	Forest	989 ha
Leasehold	Scrub	40 ha
	Forest	150 ha

Enterprises

Dairying and grazing are the main enterprises carried out at 'Hayleigh'.

We now supply bulk milk to Bundaberg and from small beginnings some three years ago, the daily milk quota is slightly over 500 litres. Dairying for quota milk has of course developed into the main enterprise and the milking herd comprises 60-70 head of Jersey and Jersey-Friesan cross.

The beef herd comprises Santa Gertrudis X Brahman cattle to maintain at least 50% *Bos indicus*. I have found that tick problems are greatly reduced with this type of animal. Bullocks and spayed cows are sold.

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A small area of scrub soils is set aside for summer cropping to provide winter grain for the dairy herd.

District Development

The Dallarnil scrub lands were originally opened up for sugar cane growing in the early part of this century. Low rainfall, droughts and the establishment of a butter factory at Biggenden in 1911 caused a slow swing away from cane farming to dairying. Rhodes grass (*Chloris gayana* cv. Pioneer) was planted in the old cane lands, but through overstocking and dry times Rhodes grass disappeared and scrub regrowth including lantana invaded and reduced productivity.

In the immediate post war years machinery became available and together with green panic (*Panicum maximum* var. *trichoglume*) some control was exercised over the regrowth and weed problem. The mid sixties saw the introduction of the Dairy Pasture Sudsidy Scheme (DPSS) and Siratro (*Macroptilium atropurpureum*) and through this scheme I was able to commence larger scale development of the scrub soil area.

Property Development

Prior to 1967 we had commenced developing the scrub soils to pasture, burning scrub regrowth and lantana and sowing green panic and Gayndah buffel (*Cenchrus ciliaris*) into the ash. This method proved successful and by 1956 40 ha of pasture had been planted.

In 1965 the D.P.I. established a sizeable demonstration area of Siratro and Rhodes (*Chloris gayana* cv. Callide) on scrub clay loams. To my knowledge this was the first paddock planting of Siratro in the district and it is of interest that the pasture is still highly productive with Siratro a very stable component.

In 1967 we planted our first pasture under the DPSS with 8 ha of old crop land being sown to Callide Rhodes grass, green panic, Kazungula setaria (*Setaria anceps*), silver leaf desmodium (*Desmodium uncinatum*) and Hunter river Lucerne (*Medicago sativa*). Fertilizer included 250 kg ha^{-1} of Mo 12 superphosphate. Green panic and Callide Rhodes are still present but the planted legumes and Kazungula setaria have disappeared. Siratro has appeared in the paddock, presumably carried there by cattle and is spreading and bulking up.

Fodder cropping for dairy cattle was becoming too expensive and time consuming and we thought that perhaps by increasing the areas sown to improved pastures the fodder cropping program could be reduced and eventually phased out. To this end a small bulldozer was purchased and the next project was to develop 20 ha of a rough hill paddock which had reverted to lantana and spear grass.

The area was cleared by bulldozer, chisel ploughed and then disced twice before planting green panic, hunter river lucerne, Siratro, and dolichos (*Lablab purpureus*). The pasture is now highly productive with green panic and Siratro persisting.

Following on this success we have progressively planted a further 70 ha, with Siratro and green panic. Cooper glycine (*Glycine wightii*) however was included at 1 kg ha^{-1} over 48 ha. It is interesting to note that although very slow to start, glycine is now well established.

In 1974 the original 40 ha paddock that was planted to green panic and buffel, had reverted to scrub. The paddock was swept with a bulldozer and Siratro broadcast at 1 kg ha^{-1}; fertilizer was not applied. This low cost method of introducing Siratro into an existing grass pasture has proved very successful.

Summarising our development since 1967, we have planted and renovated 138 hectares of scrub lands to Siratro and green panic, and significantly improved animal production.

Management

Managing established pastures so that productivity is maintained is difficult and mistakes are easily made. We believe that a new pasture must be allowed to seed

down in its first year and this is even more important if establishment is not good. In the Biggenden district, Siratro may take up to two summers to become firmly established, especially if the pasture is planted late or rainfall is below average in the first year.

In a dairying situation set stocking is not practical and the pastures are grazed rotationally. Grazing pasture lower than 15 cm is avoided, however during the 1969 drought the pasture paddocks were virtually red soil.

During the height of summer our dairy herd often cannot cope with the high rate of pasture growth and beef cattle are used as a control to maintain pasture in prime condition. On an annual set stocking basis the pasture paddocks could be grazed at 0.8 beasts ha^{-1}. Although this stocking rate is probably no better than that which can be achieved on a pure green panic stand, there is no doubt that through the inclusion of Siratro higher milk production is obtained.

Only one pasture paddock has been top dressed but with no visible improvement as the scrub soils appear to have sufficient fertility to maintain pastures in good condition provided overgrazing is avoided.

Every effort is made to keep fires away from the pasture paddock. The benefits of pasture litter in moisture retention are quite obvious and I cannot foresee a situation where pasture paddocks would be burnt by choice.

Perhaps the most important aspects of management is in selecting the right pasture species, and planting sufficient area for your herd. Siratro and green panic are well suited to our property and since the introduction of Siratro it would seem that enough nitrogen is being fixed to maintain green panic on the scrub hills.

Conclusion on Siratro based Pastures

My reasons for considering Siratro a very valuable plant are:—

(1) Siratro's ability to survive under harsh conditions. In the 1969 drought for example Siratro survived very heavy grazing.
(2) Siratro has the ability to spread naturally to new paddocks through animal manure, and once established to thicken up.
(3) Siratro has enabled us to maintain a stable pasture.
(4) Siratro is an extremely vigorous summer growing legume with little productivity in spring and none in winter. The dormant winter period and slow spring growth allows the companion grass, especially green panic, to get away again after being suppressed in summer.
(5) The massive amount of feed that Siratro produces is best utilised in autumn and winter, when grass protein is low.
(6) Siratro builds up large quantities of litter and it is noticeable that pasture paddocks retain moisture for longer periods than those without Siratro. I also believe soil fertility and structure are improving through litter decay.

Milk production from our sown pasture is better than 10 l per head per day and bail feeding is only required for a short period in winter. Hand feeding has been reduced by 90%, and there is no doubt that Siratro has been the main reason for our achievements in increasing milk production and reducing the need for annual fodder cropping.

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