SIRATRO PASTURES IN THE MACKAY DISTRICT

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Location

The Mackay district covers an area of approximately 2500 km² from south of Carmila to Proserpine in the north and extends to Nebo and Barmount in the west. Mackay itself is located at 21°12'S, 149°12'E.

Climate

Rainfall is summer dominant, 80% being received from December to April inclusive. The mean annual rainfall varies from 1700 mm at the coast to 700 mm in the western section of the district. Mean summer maximum is in December in the 29-32°C range. The coolest month is July with a mean temperature of around 15°C with a minimum of 7-10°C. Away from the coast severe frosts affect pasture growth and quality during the winter months.

Vegetation

Vegetation on the coast ranges from ti-tree woodland on the lower lying coastal areas to blady grass with swamp mahogany and bloodwood forests on the better drained soils. In the drier areas, spear grass is found with eucalypt open forests, also brigalow and softwood scrub.

History

During 1965 the Department of Primary Industries planted trial plots of various legumes to evaluate their performance in the Mackay district. In 1966 graziers expressed an interest in planting tropical pastures and several meetings were organised by Mr. Vivian Bull with Dr. Redrup, the guest speaker, to stimulate interest in commercial plantings. The first sizeable pasture planting occurred during the following year. As there was very little available information relevant to the district regarding species evaluation, a "shot-gun" mixture of tropical pasture legumes, as well as a variety of grasses, was planted to see which species would perform best. Siratro was the legume one simply could not overlook, for in many instances it was the only legume that survived the mistakes of timing and techniques of planting. By 1968 enough confidence in Siratro's ability to withstand and survive drought had been gathered by the writer to suggest the planting of this legume in the Nebo area which receives an average of 720 mm of rain annum^{-1}. Seeding was carried out by aircraft onto mixed brigalow/belah country that had been chain pulled and the timber burned. Associated grasses were Biloela and Gayndah buffel as well as Rhodes grass and green panic. Due to an error, the seeding rate was less than 70 g ha^{-1}. During the first summer an inspection revealed that Siratro was making satisfactory progress and the plant population was better than expected. Over the ensuing years Siratro multiplied to such an extent that it contributed greatly to the pasture productivity and has survived several dry years to confound the critics of this experiment. With this added experience bolstering the confidence in Siratro, plantings took place on several properties in the Barmount region (200 km north of Rockhampton) where precipitation and soils are similar to the Nebo area. All of these plantings have survived to this day and have developed into highly productive pastures. The present area of Siratro based pastures in the Mackay district is approximately 35 000 ha and a further 3000 ha has been planted during the 1976-77 season.

Establishment Methods

Siratro has been established on a wide range of soils using various techniques, from full cultivation with two ploughings, harrowing and seeding to burning of native

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grasses and seeding into the ashes. Cost of development of these pastures varies greatly, from \$10-\$200 ha^{-1}. Generally, the most successful methods of establishment are those involving the most cultivation and are consequently the most costly.

Seeding Rates

The recommended seeding rate of Siratro in the area is 2 kg ha^{-1}. On many occasions successful establishment has been achieved with a rate as low as 0.25 kg ha^{-1}.

Grasses

Siratro is grown with a wide variety of grasses ranging from native spear and blady grass, to buffel, green panic, Kazungula setaria, common guinea and *Paspalum plicatulum*. The grasses are selected mainly for their suitability to soil types.

Fertilizer

Common rates of fertilizer applications range from 200-500 kg ha^{-1} of molybdenum superphosphate (9.2% P, 10% S, 0.02% Mo) at establishment, maintenance rates vary from 100-200 kg ha^{-1} of single superphosphate per annum. Rates depend on soil type and the intensity of development. In some instances Siratro pastures have been established on fertile soils without any fertilizer, but lower stocking rates had to be used to maintain legume content. The need for potassium has not been established in the district.

Management Recommendations in the Mackay Area

The aim of early management should be to allow Siratro to produce a good initial seed crop. Heavy grazing during establishment is to be avoided. Stocking rates are varied according to forage available, however, experience has shown that stocking rates to maintain Siratro production should not exceed 1.7 beasts ha^{-1} on the coast and 0.8 beasts ha^{-1} in the 700-900 mm region. Unfortunately, these recommendations are not adhered to and overgrazing has suppressed Siratro yields but, provided a good initial seed set had occurred and adequate rest periods and applications of superphosphate had been allowed, Siratro pastures have recovered.

The type of management in the district varies from set stocking of medium to large areas to intermittent grazing on smaller pasture areas. We are not sure how to manage effectively small areas of Siratro on large properties. Problems with Siratro persistence have occurred on the wetter, poorly-drained soils where correct management, particularly avoiding overstocking, is required to maintain adequate Siratro populations. To maintain pasture production the Siratro content of the pasture should appear to be dominant, which is usually in excess of 20% of dry matter yield. It has been observed that during the early part of the wet season cattle seem to prefer grasses to Siratro and this does allow the Siratro to grow vigorously. During the drier part of the year Siratro is readily accepted by stock.

To achieve full control of woody weeds in Siratro based pastures, slashing or spot chemical treatments during the first year may be necessary, but generally, provided a vigorous Siratro population is maintained, few troubles have arisen with the regrowth of *Eucalyptus* and *Melaleuca* species in cultivated areas and a fair measure of weed control has been achieved even in uncultivated situations. However, we have encountered certain weed species such as Devils fig (*Solanum torvum*) which are not suppressed by Siratro. Spectacular success in the control of grader grass (*Themeda quadrivalvis*) has been achieved with Siratro pastures, provided they are not overgrazed and an adequate ground cover is maintained.

Animal Production

Liveweight gains of 255 kg ha^{-1} $annum^{-1}$ have been achieved in the coastal district where stocking rates have not exceeded 1.7 beasts ha^{-1}. Siratro is also a component of the dairy pastures of the district, but no data is available as to its contribution either to milk production or to milk quality. In our experience cattle grazing

frosted Siratro pastures continue to thrive and do well even into the late winter in the drier regions of the district and the writer feels that Siratro does maintain a reasonably high protein content for long periods, provided no rain or heavy dews occur after frosts. Our general observations are that the higher the legume content of the pasture the better the animal performance.

Seed Production

Siratro has been grown in the wetter parts of the district for seed production, but problems have arisen in relation to persistence due to the disease problems, mainly *Rhizoctonia*, and the invasion of native grasses due to the high nitrogen build-up. Attendant problems associated with seed production were attacks by aphids and plagues of khaki climbing rats. The rats chewed through the woody parts of the plant and in 1974 devastated large patches of Siratro.

Erosion Control

Siratro is widely used throughout the area to assist in successfully stabilizing embankments and other earth works.

Conclusions

Disadvantages

Suppression of Siratro by overstocking and its susceptibility to *Rhizoctonia* are the major disadvantages in our area.

Advantages

Siratro is the most successful and widely used legume in the Mackay district. It persists as the mature plant or by seedling regeneration. It also spreads vegetatively from runners which root at the nodes. Being relatively unpalatable during certain parts of the year allows it to establish well and contributes to a sizeable pasture yield. Experience indicates that Siratro is very efficient in supplying nitrogen to associated grasses. Its ability to flower and set seed under moisture stress and its high percentage of hard seededness enables seed to persist in the soil for a number of years. Its contribution to weed control and its assistance with erosion control have been a distinct advantage. It is fair to say that without the availability of Siratro, the pasture development in the Mackay district would not be as successful as it has been to date.

(Accepted for publication December 22, 1976)