

FIELD MEETING OF THE CENTRAL QUEENSLAND SECTION ON JULY 6, 1973

NITROGEN ON TROPICAL PASTURES

This field meeting was held at "Beacon Pastures" to demonstrate the use of pangola grass (*Digitaria decumbens*) with nitrogen and irrigation and to discuss problems associated with the use of nitrogen fertilizers on tropical pastures.

"Beacon Pastures"—Property of C. W. W. Pask, Mackay

"Beacon Pastures" borders the northern bank of the Pioneer River on the outskirts of Mackay. It is 14 ha (36 ac) in area and has a 1,650 mm (65 in) annual rainfall. The soil is a deep sandy loam.

It was originally a cane farm, but after being badly damaged by floods it was no longer considered suitable for cane. Since purchasing the farm in 1961 a large number of grasses and legumes have been tried, but because of vigorous weed competition only pangola grass (*Digitaria decumbens*) persisted. The whole farm has now been planted to pangola grass which is fertilized with nitrogen.

Ten ha (25 ac) are irrigated from two wells during dry times of the year, the nitrogen being applied in the irrigation water. Irrigation starts in early May and unless rain falls the pastures are irrigated every 21 days, 75 mm (3 in) being applied each time. 250 kg ha⁻¹ (2 cwt ac⁻¹) of urea is applied with the first irrigation and, subsequently 125 kg ha⁻¹ (1 cwt ac⁻¹) at each irrigation until the first storms begin. Total nitrogen application is in the region of 700 kg ha⁻¹ (600 lb ac⁻¹) per year. On the area not irrigated a total of 230 kg ha⁻¹ of nitrogen (200 lb ac⁻¹) is applied in two applications a year. In addition to nitrogen, 125 kg ha⁻¹ (1 cwt ac⁻¹) single superphosphate is also applied. In 1972 this was increased to 250 kg ha⁻¹ (2 cwt ac⁻¹) and 125 kg ha⁻¹ (1 cwt ac⁻¹) muriate of potash and 8 kg ha⁻¹ (7 lb ac⁻¹) of copper sulphate and zinc sulphate were also applied.

Experience at "Beacon Pastures" suggests that pangola grass should be grazed short at all times. Approximately 15 cm (6 in) is ideal, unless a hay crop is wanted. This year 550 bales of high quality hay was made from one of the paddocks. Outbreaks of the pangola grass rust disease (*Puccinia oahuensis*) have occurred on this property for three years, but to date no real loss in growth or palatability has been observed. In 1971 there were heavy aphid populations just prior to the wet season, but these had no appreciable effect on production. The introduction of the Afro-Asian dung beetle (*Orithopagus gazella*) has been of great value, by effectively reducing fouling of pastures and increasing pasture utilization.

At the present time there are 137 cattle on the property and on average more than 10 beasts ha⁻¹ are carried throughout the year. A red brahman stud was started in 1970 and bulls are bred for sale by private auction on the property in November each year.

DISCUSSION

Discussion associated with the use of nitrogen on tropical pastures was led by Dr. E. F. Henzell. Main points to arise were as follows.

1. The most suitable form of nitrogen to use is either urea or Nitram*. The use of sulphate of ammonia is not recommended because of its deleterious effects on soil pH. Although it would be possible to counter this effect on soil pH by the use of lime, it would not be economical to do so. It makes no difference to soil pH whether sulphate of ammonia is applied as one large dressing or whether applica-

*Proprietary trade name for ammonium nitrate.

tions are split. Moreover sulphate of ammonia is much more expensive per pound of nitrogen than either urea or Nitram. On average Nitram is 10-15 per cent more effective than urea but due to differences in price the cost per unit of effective nitrogen is similar.

2. Under rain-fed conditions nitrogen should be put on in not less than 4 applications per year and the most effective number seems to be 6 applications.

3. At "Beacon Pastures" the urea is applied by putting it into the well about one hour before irrigation is finished. This allows the urea to be washed into the soil.

4. It is most important to see that adequate levels of phosphorus and potassium are applied. Often poor responses from nitrogen applications can be traced to a shortage of these elements. It is unlikely that deficiencies of other nutrients will limit grass growth in this area.

5. Pangola grass has proved to be a very productive grass in the Mackay area. In contrast to other areas in Queensland it is not being seriously affected by aphid or by rust. With regard to alternative grasses the most suitable would seem to be *Brachiaria decumbens* which has out-yielded pangola grass at South Johnstone on the north tropical coast. Some grasses, such as *Paspalum plicatulum*, can withstand acidity better than others.

6. There is only one strain of pangola grass in commercial use. There are a number of related species which are at present being tested for resistance to rust, but none of these are commercially available.