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**PERFORMANCE OF KENNEDY RUZI GRASS ON THE
WET TROPICAL COAST OF QUEENSLAND**

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SUMMARY

The productivity of pastures of common guinea grass/legume, ruzi grass/legume and ruzi grass/nitrogen fertilizer was examined over a period of 2½ years using Brahman cross steers grazed at 2 beasts/ac over the wet season and 1 beast/ac for the rest of the year. Consistently inferior liveweight gain per acre was recorded from both ruzi grass pastures, although at a medium nitrogen application rate the ruzi grass performance approached that of the guinea grass/legume pasture.

I. INTRODUCTION

For many years *Panicum maximum* (common guinea) has been the grass most widely grown in combination with legumes in tropical coastal pastures between Ingham and Daintree (Teitzel 1969). In 1965 the sward-forming ruzi grass (*Brachiaria ruziziensis* cv. Kennedy), seed of which germinated readily while similar species such as para grass (*Brachiaria mutica*) and pangola grass (*Digitaria decumbens*) had to be planted by runners (Davidson 1966), was approved for release by the Queensland Herbage Plant Liaison Committee. Both guinea and ruzi grass grow best under conditions of high soil fertility and good drainage.

In a cutting trial conducted at South Johnstone Research Station between 1964 and 1966 (Grof and Harding 1970), dry-matter yields of Kennedy ruzi grass compared very favourably with those of common guinea grass—18,000–19,000 lb/ac/year. As ruzi grass came into limited use on coastal properties, its local evaluation for cattle fattening was undertaken. This note represents the results of one trial conducted at the Utchee Creek sub-station of South Johnstone Research Station, using grazing animals to assess the comparative value of Kennedy ruzi grass and common guinea grass.

II. MATERIALS AND METHODS

The 32 ac trial area was on a fertile, well-drained, red basaltic soil. It was cleared of rain-forest in 1965 and planted in 1966 to eight pasture mixtures, four based on ruzi grass and four on guinea grass. The pastures planted were:—

1. Ruzi grass + *Centrosema pubescens* (centro).
2. Ruzi grass + *C. pubescens* + *Desmodium intortum* + *Glycine wightii* (Tinaroo glycine).
3. Ruzi grass + *C. pubescens* + *D. heterophyllum* (hetero) + *Vigna hosei*
4. Ruzi grass + *C. pubescens* + *D. canum* + *Stylosanthes guyanensis*.
5. Guinea grass + *C. pubescens*.
6. Guinea grass + *C. pubescens* + *Pueraria phaseoloides* (puero) + *G. wightii*.
7. Guinea grass + *C. pubescens* + *Calopogonium coeruleum* + *V. luteola*.
8. Guinea grass + *C. pubescens* + *S. guyanensis* + *G. wightii*.

Each pasture was planted in two 2 ac paddocks. Early growth of both grasses was extremely vigorous, particularly so in the case of ruzi grass, and in some plots of both species the legumes were overgrown in the first wet season. Efforts to improve the legume stand in the weaker plots by sod-seeding and hand-planting of cuttings were less successful with ruzi grass than with guinea grass, and trial grazing ultimately commenced with two ruzi treatments having the lowest legume content (numbers 1 and 4) being converted to grass plus nitrogen fertilizer treatments. The nitrogen was applied as urea in 5–8 dressings of 25 lb/ac of nitrogen over the late autumn to early midsummer period each year.

The paddocks in a treatment pair were grazed alternately for periods of 2 weeks. Two stocking rates were used: 2 beasts/ac from mid December to mid April and 1 beast/ac from mid April to mid December. Brahman crossbred steers were introduced at around 600 lb liveweight, and were replaced when the majority of the animals in each draft were in a finished condition with a liveweight range of 850–950 lb. Cattle were weighed monthly. Actual trial grazing took place from April 22, 1968, to December 16, 1970, with a gap from October 7, 1968, to January 15, 1969, due to a breakdown of the water supply to the area.

III. RESULTS AND DISCUSSION

By the second year of grazing the legumes remaining in useful amounts in the guinea grass plots were centro, Tinaroo glycine, *Calopogonium coeruleum*, and to a lesser extent puero. In the ruzi grass/legume pastures, centro, Tinaroo glycine, hetero and *Vigna hosei* were still present but the estimated legume content did not exceed 5% of the mixture. This was considerably less than the estimated 10–20% of legume in the guinea grass pastures. There were no liveweight gain differences attributable to any of the various mixtures of legumes. Results are presented in Table 1 for the means of four pairs of plots under guinea grass/legumes, two pairs under ruzi grass/legumes and two pairs under ruzi grass/nitrogen.

TABLE 1
SEASONAL PERFORMANCE OF LIVESTOCK GRAZING THE THREE PASTURE TYPES

Period	Stocking Rate (beasts/ac)	Nitrogen Applied (lb/ac)	Mean Liveweight Gain/ac (lb)		
			Guinea/Legume	Ruzi/Legume	Ruzi/Nitrogen
Initial draft—					
24. iv. -7. x. 68	1	100	204	112	189
Summer wet—					
15. i. -23. iv. 69	2	25	263	229	240
17. xii. 69 -7. iv. 70	2	Nil	335	232	285
Autumn-Winter—					
23. iv. -30. vii. 69	1	25	80	32	74
7. iv. -29. vii. 70	1	25	146	117	138
Spring-Early summer—					
30. vii. -17. xii. 69	1	75	195	117	189
17. viii. -16. xii. 70	1	135	208	185	233

Altogether six different drafts of cattle were used, but in only one case, the period from August to December 1970, did the animals grazing on ruzi grass (those plots fertilized with nitrogen) gain more than those on guinea grass treatments.

During the wet summer periods production from both grasses was similar, but during late autumn and winter production from ruzi grass was less than that from guinea grass. This can be explained by the fact that ruzi grass was seeding prolifically by April, and from then until higher temperatures returned in spring little or no growth took place unless the winter was warmer than usual. Guinea grass seeded very lightly under the high wet-season stocking rate, and this phase was ended by late March. Useful leafy growth was then produced before the onset of cool weather and short days in June, when it also exhibited a marked slowing down in growth but not to the same extent as ruzi grass.

In spring and early summer production from ruzi grass also tended to lag, but nitrogen applications helped overcome this. During this period in 1970 above-average rainfall was received, and while both grasses benefited the ruzi grass pastures responded proportionately better than the guinea grass pastures.

There were pronounced seasonal variations in the daily liveweight gains of the cattle. In both full years of the trial lower rates of gain were recorded in the autumn and winter than in the wet summer, with a marked upsurge in the following spring and early summer (Figure 1).

A similar pattern in the daily liveweight gain figures occurred in all three pastures, though the cool-season drop was less pronounced with ruzi grass than with guinea grass in 1970. It is suggested that the effect is largely, if not wholly, associated with the drastic change in stocking rate from 1 beast/ac to 2 beasts/ac for the wet season. A less severe increase in stocking rate, or a return to 1 beast/ac earlier than mid April, could be expected to reduce the seasonal fluctuation in the rate of liveweight gain.

Overall there was little difference between the total liveweight gain per acre from the guinea grass/legume pastures and the ruzi grass/nitrogen pastures. However, when the cost of the nitrogen fertilizer is considered the legume-based guinea grass becomes much more attractive. The ruzi grass/legumes pastures were markedly inferior.

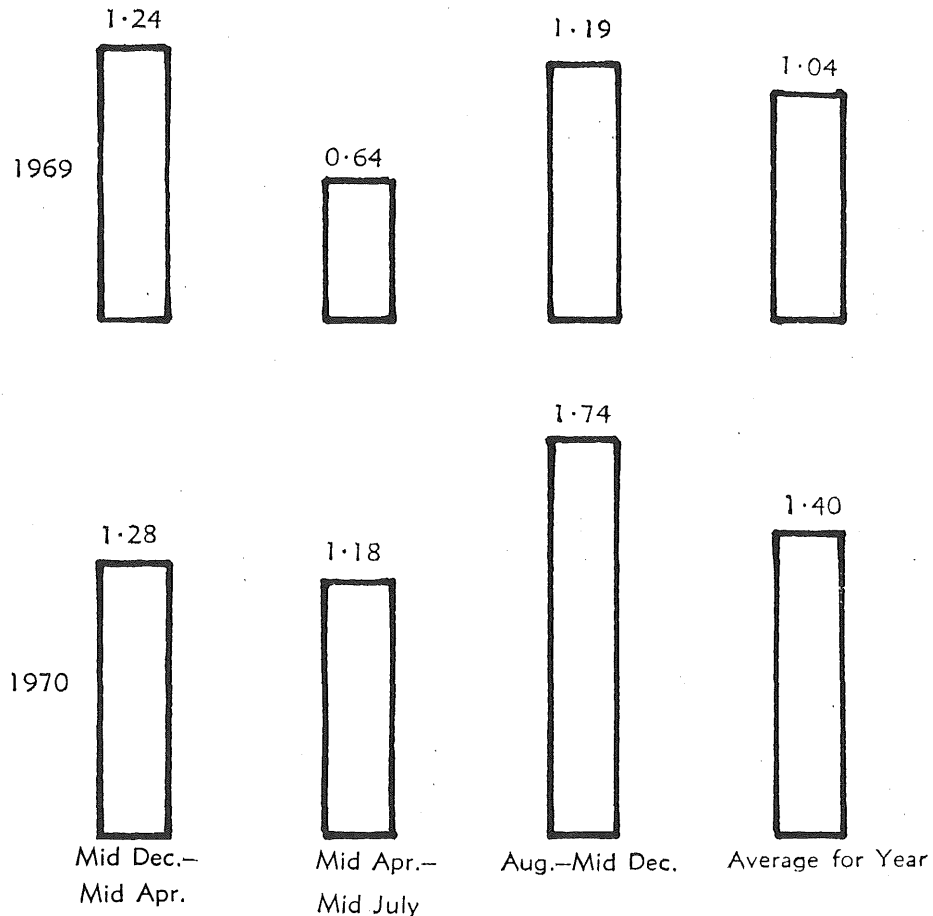


Fig. 1.—Seasonal average daily rate of liveweight gain per animal.

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REFERENCES

- DAVIDSON, D. E. (1966).—Five pasture plants for Queensland. *Qd agric. J.* 92:461-3.
 GROF, B., and HARDING, W. A. T. (1970).—Dry matter yields and animal production of guinea grass (*Panicum maximum*) on the humid tropical coast of north Queensland. *Trop. Grasslds* 4:85-95.
 TEITZEL, J. K. (1969).—Pastures for the wet tropical coast 3. *Qd agric. J.* 95:465-7.

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