

# SABI GRASS (*UROCHLOA MOSAMBICENSIS*) AS A COMPONENT OF TOWNSVILLE STYLO (*STYLOSANTHES HUMILIS*) PASTURES

L. FALVEY

## SUMMARY

The liveweight changes of steers grazing pastures sown to T.S. and T.S.-Sabi are compared. Liveweight change varied with legume content of the sward most of the year except during the early wet season. The T.S. pasture produced significantly higher liveweight gains over the whole period of the experiment, probably because of its higher proportion of legume. Despite the difference in animal productivity a T.S.-Sabi pasture is probably easier to manage to maintain the legume component.

## 1. INTRODUCTION

The use of Townsville stylo (T.S.) (*Stylosanthes humilis*) as a pasture species has allowed very much higher weight gains to be achieved over native pastures by increasing liveweight gains per animal and per hectare, (Norman, 1961). One problem of T.S. pastures is invasion by annual grasses which eventually lower animal production, Norman (1965) suggested that increased grazing pressure would control this invasion on Tippera clay loam at Katherine, and Falvey (1975) determined a similar requirement for Blain sand in the north Tipperary region.

An alternative means of overcoming this problem is the deliberate inclusion of a perennial grass in the sward to occupy the same niche as the invading annual grasses. Such a grass, however must be persistent yet not so vigorous as to compete significantly with the T.S. (Austin, 1970). This grass could also provide more rapid regrowth after rains which render the dry annual species unpalatable, and promote soil stability during the early heavy showers of the wet season.

Austin (1970) reported high levels of animal production from a T.S. pasture including the perennial Sabi grass (*Urochloa mosambicensis*). This paper reports a comparison between a T.S. pasture and a T.S.-Sabi pasture,

## 11. METHOD

The experiment was conducted at Douglas Daly Experiment Station 160 km south of Darwin which is in a tropical monsoon region receiving a mean annual rainfall of 1100 mm, 90% of which falls between November and March,

Two, four hectare paddocks of Townsville stylo and two, four hectare paddocks of Townsville stylo - Sabi grass were each stocked with eight Brahman cross steers on 20/7/72. The stocking rate was reduced to 1.75 steers per hectare by removing the lightest animal in each treatment on 14/11/73 to compensate for the increased grazing pressure as the steers grew. Steers were weighed at four weekly intervals,

Pastures were sampled regularly for botanical composition and dry matter availability. Botanical composition was estimated by the dry weight rank method. Dry matter availability was estimated by taking 10, 0.4m<sup>2</sup> quadrat cuts per paddock or by harvesting a 30 x 0.2m strip with a small forage harvester at 7 cm above the ground.

Faecal grab samples of similar size were collected per rectum from each animal during the dry season. Samples from the steers in each paddock were bulked, dried at 100°C for 24 hours (Falvey and Woolley, 1974) and analysed for nitrogen and in some cases phosphorus.

Results presented in table 1 are divided into season periods. "Early wet season" refers to a period of about eight weeks after the opening rains while the period called "All wet" includes this period and the remaining four months of the wet season. The dry season is a period of about six months between May and October.

## 111. RESULTS

### (a) Liveweights

The liveweights of steers and the date of the opening rains of each wet season are presented in figure 1. Liveweight changes of steers on the T.S.-Sabi pasture are significantly ( $P < 0.05$ ) higher during the early wet season in all three years. Over the whole wet season there was no significant ( $P < 0.05$ ) difference in liveweight change in two years and in the other year the T.S. pasture was superior. In each dry season the steers grazing the T.S. pasture showed significant ( $P < 0.05$ ) advantage over those on the T.S.-Sabi pasture. Over the three year experimental period, T.S. was significantly ( $P < 0.05$ ) superior.

### (b) Botanical composition and Dry Matter Availability

The mean percentages of T.S. and grass and the dry matter production figures for both pastures are presented in table 1. The grass component for the T.S. pasture represents invading annual grasses whereas the grass in the T.S.-Sabi pasture is Sabi grass alone.

Weed invasion in the T.S.-Sabi pasture was minimised and did not usually include other grasses. The main invading grass species in the Townsville stylo pastures were Brachiaria pubigera, Digitaria ciliaris, Panicum affairoides and Setaria dielsii.

The proportion of T.S. was always greater in the T.S. pasture.

Correlation coefficients indicate a positive association between the percentage legume in a sward and the liveweight gain during the dry season, and a negative association during the early wet season. Significant correlations were only recorded during the 1973 dry season ( $r = +0.97$ ,  $P < 0.05$ ) and the 1973/74 wet season ( $r = -0.91$ ,  $P < 0.10$ ).

Dry matter availability was similar on both swards and was not limiting at any stage.

### (c) Faecal crude protein and phosphorus

The mean faecal crude protein and phosphorus contents for steers grazing both pastures are also presented in table 1. The faecal crude protein values of steers grazing the T.S. pastures were consistently higher than those grazing the T.S.-Sabi pastures. Faecal phosphorus levels were generally higher on the T.S.-Sabi pasture.

Correlations between faecal crude protein values and liveweight gain were never significant although in the 1974 dry season a correlation coefficient of  $+0.97$  ( $P < 0.05$ ) was calculated between the mean percent legume from three estimates and the mean faecal crude protein values.

TABLE 1.

Liveweight change, legume percentage, dry matter, yield, faecal crude protein and phosphorus for seasonal periods throughout three years.

Seasonal Period Year	Dry 1972	Early Wet 72/73	All Wet 72/73	Dry 1973	Early Wet 73/74	All Wet 73/74	Dry 1974	Early Wet 74/75	All Wet 74/75
Liveweight Changes (kg)									
T.S.	6.3	10.8	84.2	3.0	31.7	107.5	0.9	39.0	107.8
T.S./Sabi	-0.8	15.9	78.4	-9.0	39.8	87.6	-17.3	53.6	96.3
% Legume									
T.S.	13	36	29		41	52	38	42	48
T.S./Sabi	5	28	20		23	23	27	7	24
Dry Matter Yield (kg/ha)									
T.S.			2170	2250	3490	2600			1900
T.S./Sabi			2420	2450	3360	3760			1780
Faecal Crude Protein (% D.M.)									
T.S.			8.4	6.8			8.1	10.6	
T.S./Sabi			7.9	5.5			6.6	8.5	
Faecal Phosphorus (% D.M.)									
T.S.							.229	.292	
T.S./Sabi							.292	.470	

#### IV. DISCUSSION

The T.S. pasture showed significant liveweight advantage during each dry season, during the latter part of each wet season, and during 1974, over the whole period of the wet season. The T.S.-Sabi pasture on the other hand showed a significantly lower liveweight loss after the opening rains of the wet season and significantly greater liveweight gain during the early wet season.

The two main differences between the pasture types were the different proportions of T.S. in the swards and the grass species present. Previous discussions have considered the grass species present to be a more important issue (Austin, 1970). This appears to be true only during the early wet season when the perennial nature of the Sabi grass allows a quicker response to increased moisture. The negative correlation between the percentage legume and liveweight gain at that time of the year indicates that T.S. is probably not the species being grazed to any extent, most probably due to low accessibility of new growth and unpalatability of the older material. The correlation between percentage legume and liveweight gain in the dry season indicates that nitrogen content of the diet is more important for the rest of the year.

Faecal crude protein determinations reflect the nitrogen content of the diet (Moir, 1960) and in this case steers grazing the T.S. pasture had higher faecal crude protein levels. Winks and Laing (1972 and pers. comm.) observed that when faecal crude protein falls below 8%, liveweight loss can be expected. This has been observed in this case where the steers grazing the T.S. pasture with a mean faecal crude protein content of greater than 8% continued to gain weight while those grazing a

T.S.-Sabi grass pasture and having a mean faecal crude protein content of less than 8% lost weight. The lack of significant correlation between faecal crude protein and liveweight gain indicates that further interpretation of the relationship is complex.

A positive correlation between the mean faecal crude protein content and the mean percentage legume in the sward over the 1974 dry season and between liveweight change and percentage legume in the 1973 dry season indicates that a little nitrogen is supplied by the grass component of the pastures.

While a significant difference between these pastures was recorded in this experiment, a major extension barrier exists in convincing property managers of the importance of high stocking rates to maintain the legume component of the swards. Experience has shown that a T.S.-Sabi pasture can withstand greater mismanagement than a T.S. pasture and still respond to correct management later. Hence pasture recommendations vary with the intended grazing management of the area.

#### V. ACKNOWLEDGEMENT

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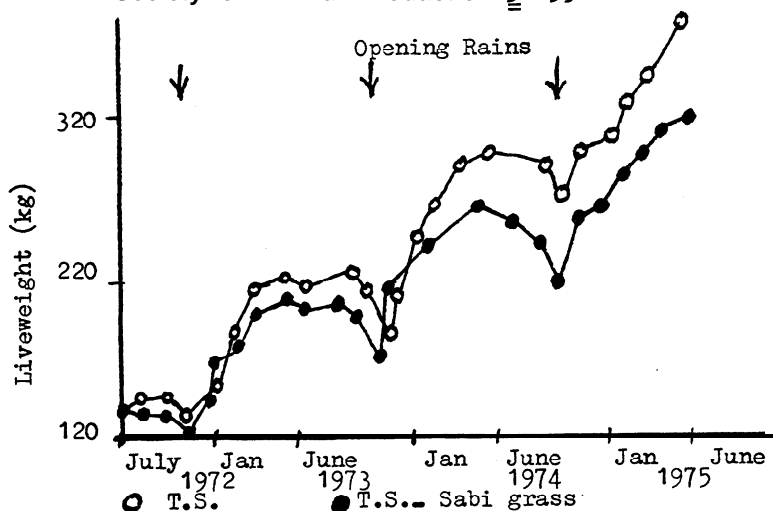


Figure 1. Liveweights of steers on two Townsville stylo pastures