PERFORMANCE OF FOUR FODDER CROPS IN COCONUT GARDEN UNDER RAINFED AND IRRIGATED CONDITIONS

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ABSTRACT

A field experiment was conducted at Central Plantation Crops Research Institute, Regional Station, Kayangulam, during 1975–77 to compare the performance of four fodder crops—two genotypes of hybrid Napier, viz. Pusa Giant and NB 21, Guinea grass (Maekuenii) and legume *Stylosanthes gracilis*, in coconut gardens under rainfed as well as under irrigated conditions. The graminaceous fodders Pusa Giant, NB 21 and Guinea grass were on a par in herbage yield but gave significantly higher yield than the legume *Stylosanthes*, both under rainfed and irrigated conditions. The increase in yield of green fodder due to irrigation was highest in the case of NB 21 (55%) followed by Pusa Giant (44%). Under rainfed conditions and during dry season highest green fodder yields were obtained from Guinea grass.

INTRODUCTION

Earlier studies on mixed farming in coconut gardens, demonstrated the feasibility of raising fodder grasses and legumes, with summer irrigation, in the interspace of coconut (Sahasranaman and Pillai, 1976). Coconut is generally grown as a rainfed crop. Irrigation water is scarce in most of the coconut growing tracts in Kerala. Installation of irrigation equipments may not be economical for very small holdings. The present study was undertaken to evaluate the performance of four fodder crops under rainfed and irrigated conditions in the interspace of coconut and to identify suitable forage crops that can thrive and give satisfactory yield even under rainfed condition.

MATERIAL AND METHODS

The study was conducted from July 1975 to June 1977 at the

Central Plantation Crops Research Institute, Regional Station, Kayangulam, in a coconut stand aged over twenty years. The field experiment, laid out in a split plot design, consisted of two main plot treatments, viz. no irrigation (rainfed) and irrigation and five sub plot treatments, viz. hybrid Napier genotypes, (Pusa Giant and NB 21), Guinea grass (*Panicum maximum*) var. Maekuenii, Brazilian lucerne (*Stylosanthes gracilis*) and control (no fodder crop).

During July 1975 slips of all the three fodder grasses were planted giving a spacing of 50 cm × 30 cm and leaving 2 m radius around the base of the palms. The stand of *Stylosanthes* was established by dibbling the seeds in rows 30 cm apart. Fertilisers to supply 50 kg P_2O_5 and 100 kg K_2O/ha as basal dose and 150 kg N/ha annually in four split doses in the rainfed and eight split doses in irrigated plots were applied to all the fodder crops. Farm yard manure obtained from the milch cows which were fed with the fodder was uniformly spread in all the experimental plots. At weekly intervals, 28 mm depth irrigation was given with sprinklers in the plots receiving irrigation treatment. The grasses were ready for the first cutting by September and the legume by November 1975. Later, the green fodder was cut at 40–50 day interval.

Results and Discussion

Yield of fodder crops

The data on the fodder yield under various treatments are presented in Table 1. The differences in yield of green forage

Table 1. *Effect of irrigation on cumulative forage yield*

Fodder crops	Yield in t/ha			Percentage increase in yield due to irrigation
	rainfed	irrigated	Mean	
Pusa Giant	37.07	53.21	45.14	44.00
N. B. 21	41.61	64.43	53.02	55.00
Guinea grass	46.91	51.51	49.21	9.80
Stylosanthes	20.82	17.28	19.05	——
Mean	36.60	46.60	41.60	

$CD_{(0.05)}$ for comparison between fodder crops = 10.59

among the grasses were not significant. All the grasses gave significantly higher yield than the legume *Stylosanthes*.

Response to irrigation

An appreciable increase in green fodder yield, due to irrigation was shown by all the graminaceous fodder crops (Fig. 1). The

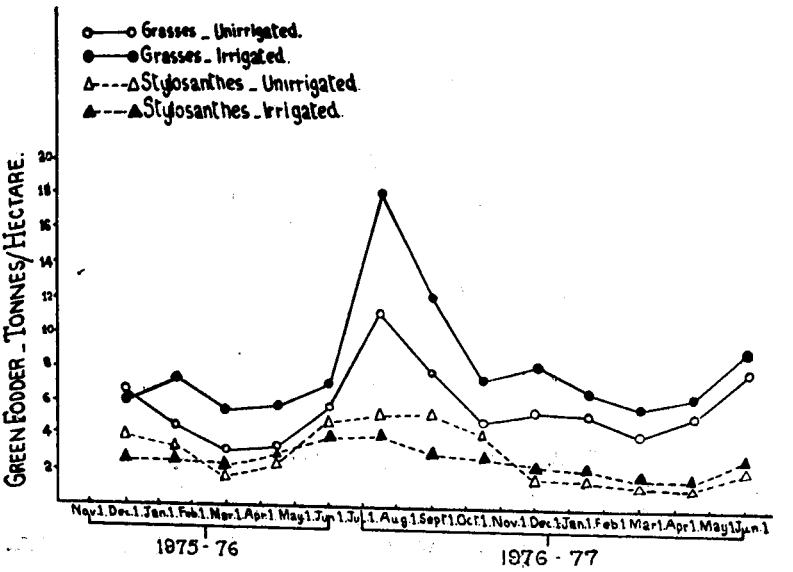

Fig. 1. Response to irrigation.

legume *Stylosanthes* showed little response to irrigation. From the irrigated plots during both the seasons, highest green fodder yields were obtained from hybrid Napier NB 21, followed by Pusa Giant and Guinea grass (Fig. 2). Maximum increase in fodder yield (55%) due to irrigation was recorded in NB 21. Pusa Giant gave 44% increased yield when irrigated whereas it was only 9.8% in Guinea grass.

Performance under rainfed condition

Under rainfed condition Guinea grass yielded 24% more green fodder than Pusa Giant and 12% more than NB 21. Higher yields from Guinea grass under rainfed condition were obtained during both the years (Fig. 2).

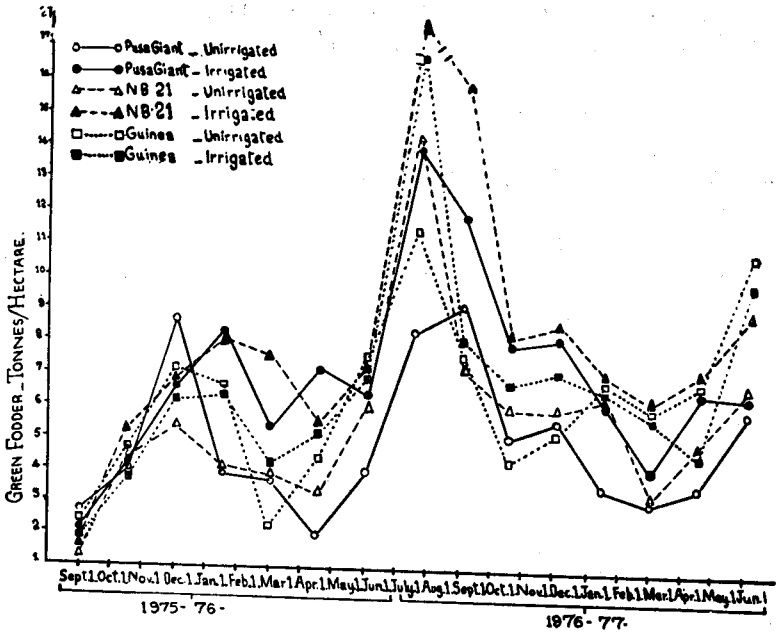

Fig. 2. Green fodder production by grasses.

Green fodder production during the dry season

Rainfall pattern of the two crop-seasons (1975–76 and 1976–77) are presented in Fig. 3. The period between December to May was relatively dry. Scrutiny of the fodder yields during this period showed that under rainfed condition, Guinea grass gave higher yield than others. With irrigation, the highest yield during the dry seasons was obtained from NB 21, followed by Pusa Giant and Guinea grass (Fig. 2).

The green fodder yields obtained in this experiment were comparable to those reported earlier (Anon., 1976 and Vikraman Nair *et al.*, 1976). The increase in yield due to irrigation observed in this study was not statistically significant, although it was substantial in the case of fodder grasses. This may be due to the comparatively low yield and the absence of response to irrigation by *Stylosanthes*. The higher yields produced by the rainfed grasses in 1976–77 can be attributed to the good summer showers received during the year.

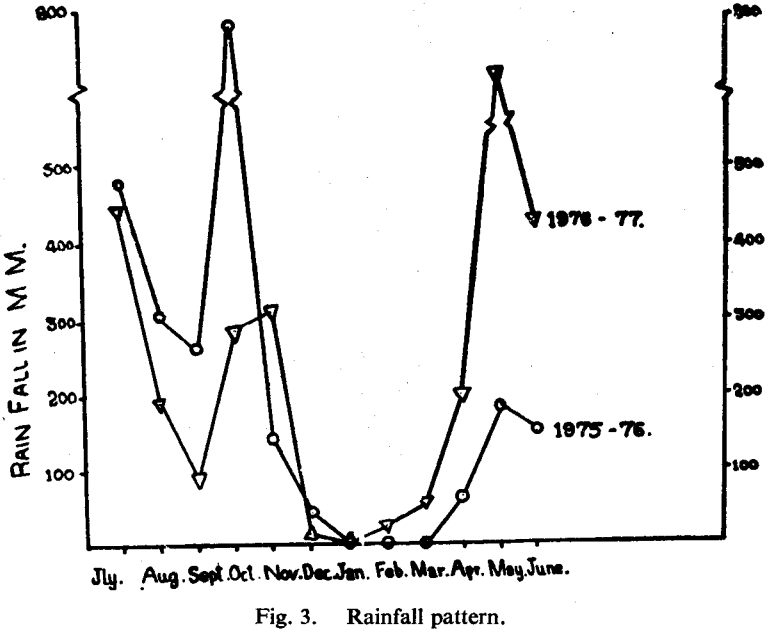

Fig. 3. Rainfall pattern.

The maximum fodder yield of 47 t/ha produced by Guinea grass under rainfed condition, clearly indicates the capacity of this grass to perform well in coconut gardens. Apart from giving highest response to irrigation, NB 21 gave higher yields than Pusa Giant under rainfed as well as under irrigated conditions. *Gill et al.* (1971) also reported the superiority of NB 21, especially its ability to yield better during summer months, over Pusa Giant.

The fodder component of daily feed of a milch animal should be about 40 kg of good quality green matter (Mathur, 1973). At this feeding rate the fodder produced by Guinea grass under rainfed condition from one ha of coconut garden, could maintain 3 milch cows, whereas the fodder from NB 21 under irrigation would be sufficient for 4 animals.

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