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Pasture studies

1 Experiment P95 (B/E)

Objective: To study the effect of 4 levels of nitrogen application and 3 frequencies of cutting on the dry matter production, persistence and quality of *Brachiaria ruziziensis* growing under coconut

Due to the adverse weather conditions that prevailed during the year, only one cycle of defoliation could be completed. The herbage dry matter yields due to different treatments are given in Table 1.

Table 1. *Herbage dry matter yields (g/m²) due to the different treatments in experiment P95*

	3 weeks	*4 weeks*	*6 weeks*	*Total*
N_0	214	215	133	562
N_1	244	232	165	641
N_2	360	293	202	855
N_4	396	315	231	942
Total	1214	1055	731	

A progressive increase in yield due to increase in the level of added N and a progressive decrease in yield due to increase in the interval of defoliation are observed. The experiment has completed 3 years and the yield trends for the 3 years due to the different treatments, are shown in Table 2.

Table 2. *Trends in the dry matter production (g/m²) over a 3 year period in experiment P95 due to levels of nitrogen application and frequencies of cutting*

	1977	*1978*	*1979*
N_0	654.1	510.6	562.0
N_1	705.3	623.0	641.0
N_2	695.1	659.4	855.0
N_4	868.5	733.1	942.0
3 weeks	1009.4	950.7	1214.0
4 weeks	857.2	836.4	1055.0
6 weeks	906.2	738.9	731.0

The yield trends indicate that although there was no significant response to added N in the year of commencement this has changed to a positive response in the 2nd and 3rd years.

2. **Experiment P97 (B/E)**

Objective: To study the yield persistence of *Digitaria decumbens* (Pangola grass) at 4 levels of nitrogen application. This is a strain of Pangola claimed to be resistant to the stunting virus that severely affected the yields of the strains that had already been introduced. This experiment has gone through 2 years and has so far not been affected by the virus. The trial was harvested on 4 occasions and the total dry matter yields for the 4 harvests at the different levels of N are given in Table 3.

Table 3. *Total dry matter yield (g/m^2) for 4 harvests at different levels of N in experiment P97*

N_0	328.0
N_1	382.2
N_2	523.2
N_4	594.2

The yield for the different treatments obtained this year was less than that recorded last year. However the response shown for added levels of N was similar to that of last year.

3. **Experiment P94 (B/E)**

Objective: To study the total plant protein and dry matter output from *Centrosema pubescens* and *Brachiaria miliiformis* at four levels of applied nitrogen when grown alone and in mixture.

Two samplings were taken during the year, one in May and the other in October. The dry matter yields for the 2 harvests are given in Table 4.

Table 4. *Total dry matter yields of the 2 samplings done during the year in experiment P94 (g/m^2)*

	grass	*legume*	*Total*
N_0	289.0	—	289.0
N_1	323.5	—	323.5
N_2	343.5	—	343.5
N_0	—	92.5	92.5
N_1	—	98.2	98.2
N_2	—	108.7	108.7
N_0	425.0	39.2	464.2
N_1	443.7	37.2	480.9
N_2	500.0	35.0	535.0

Weed infestation was very heavy in the legume only plots and this suppressed the growth of the legume. The grass legume combination treatments recorded higher yields both in total dry matter and crude protein than in the treatments where they were grown alone.

4. **Experiment P100 (B/E)**

Objective: To compare the milk yield of Sinhala x Jersey cross-bred cows maintained solely on fertilized *B. miliiformis/Centrosema pubescens* mixed pasture with those fed on a ration of concentrates and estate grass. The *B. miliiformis/Centrosema* pasture was

grazed at an intensity of one beast/acre. 26 cows in all were involved in the comparison, 13 being fed solely on pasture. The average milk yield per day for the two groups are given in Table 5.

Table 5. *Mean yield per day per cow due to different feeding managements*

	Pasture only	*Pasture + poonac*
Yield/day (pt)	5.65	5.62

The data indicate that for medium level producers such as the animals under investigation all the production requirements can be supplied by a well managed *B. miliiformis* pasture.

5 **Experiment P101 (R/E)**

Objective: To measure the effect of 2 pasture legumes (*Centro* and *Siratro*) and one shrub legume (*Gliricidia*) combined with *Brachiaria brizantha* and the grass grown alone at the same level of nitrogen application on the live weight gains by cattle.

Due to the adverse weather conditions experienced at this station during most parts of the year the pasture could not be grazed. The animals had to be grazed on estate weeds and supplements. The legume plots were weeded during the year and heifer calves will be used to graze the trials when the weather conditions improve and pasture growth is satisfactory.

6. **Experiment P102 (R/E)**

Objective: To study the performance of five pasture and four fodder grasses at two levels of nitrogen application at Ratmalagara. Two samplings were done during the year, one in October and the other in December. The total dry matter yield for the different grasses are given in Table 6. There was hardly any difference in the dry matter production among the pasture grasses tested. Of the fodder grasses the higher yield was recorded for Setaria and Green panic. There was no marked increase in yield at the higher level of added nitrogen.

Table 6. *Total dry matter yield (g/m²) for the 2 samplings done in 1979 at the 2 levels of nitrogen tested for the different pasture and fodder grasses at Ratmalagara*

Grass variety	N_1	N_2
Brachiaria miliiformis	345	437
Brachiaria brizantha	403	478
Brachiaria humidicola	473	406
Brachiaria ruziziensis	463	331
Digitaria decumbens	429	418
Panicum maximum (Green panic)	567	532
Panicum maximum (Guinea grass)	447	481
Setaria anceps	614	820
Penisitum purpurium (Pusa giant)	241	369

7 **Experiment P103 (R/E)**

Objective: To study the performance of a virus resistant cultivar of Pangola grass at four levels of nitrogen grown as an intercrop at Ratmalagara. Four samplings were

taken during the year and the dry matter yield is given in Table 7. There was a progressive increase in yield due to increase in the level of nitrogen applied. No signs of the sward being affected by the stunting virus was observed during the year.

Table 7. *Total herbage dry matter (g/m²) at the 4 harvests due to the different levels of nitrogen application with Pangola grass at Ratmalagara*

Level of N application	*Herbage dry matter yield g/m²*
Nil	... 1899.1
N_1 (40 lbs/acre)	... 2100.3
N_2 (60 lbs/acre)	... 2176.5
N_4 (80 lbs/acre)	... 2386.7

8 **Experiment P104 (R/E)**

Objective: To study the effect of levels of nitrogen application and frequencies of cutting on the growth of Green panic under coconut at Ratmalagara.

Due to the unsatisfactory weather conditions only one cycle of defoliation could be completed during the year. The dry matter yield data for that cycle are presented in Table 8. The data indicate that there was a linear response to increase in the level of applied nitrogen at both frequencies of cutting. However cutting at the 30 day interval gave a higher yield than the 45 day cutting interval treatment.

Table 8. *Herbage dry matter yield (g/m²) of Green panic due to different levels of nitrogen application and frequencies of cutting at Ratmalagara*

Treatment	*30 day cutting interval*	*45 day cutting interval*
N_0	174.0	173.7
N_1	226.4	218.1
N_2	305.2	253.8
N_4	312.0	275.5
Total	1017 6	921 1

9 **Experiment P98 (Sirikandura Estate)**

Objective: To study the yield and persistence of *Brachiaria ruziziensis* and *Brachiaria humidicola* at four levels of nitrogen application and two frequencies of cutting.

Three cycles of defoliation were completed with *B. humidicola*. *B. ruziziensis* produced very low yields and appeared to suffer at the higher level of nitrogen applied and weed infestations were heavy in high nitrogen treatments. Only one cycle of defoliation was completed with *B. ruziziensis*.

The herbage dry matter yields due to the different treatments with the two grasses are given in Table 9. The data indicate that there is a progressive increase in yield with increase in the level of nitrogen application in the case of *B humidicola* at both frequencies of cutting while in the case of *B. ruziziensis* this trend is marked only when the pasture was cut at 30 day intervals.

Table 9. *Herbage dry matter yield (g/m²) per cycle of defoliation at different levels of nitrogen application and frequencies of cutting Brachiaria humidicola and B. ruziziensis*

Treatment		*B. humidicola*	*B. ruziziensis*
30 day cutting interval	N_0	124	93
	N_1	228	157
	N_2	265	170
	N_4	344	256
	Total	961	676
45 day cutting interval	N_0	208	131
	N_1	251	155
	N_2	330	174
	N_4	494	194
	Total	1283	654

10. Experiment P99 (Walpita Estate)

Objective: To study the performance of 5 pasture and 4 fodder grasses at 2 levels of nitrogen application in the wet zone-intermediate zone border area The grasses were sampled on 5 occasions during the year and the total dry matter yields are presented in Table 10. *Brachiaria humidicola* produced the highest amount of dry matter of all the pasture/fodder varieties tested.

Table 10. *Total herbage dry matter yield of the different pasture/fodder grasses at the 2 levels of nitrogen application for the five samplings done during the year*

Treatment	N_1	N_2
Digitaria decumbens	206	258
Brachiaria brizantha	706	801
B. miliiformis	475	821
B. ruziziensis	747	639
B humidicola	890	1135
Panicum maximum (Green panic) ...	391	558
Setaria anceps	395	643
P. maximum (Guinea grass) ...	794	1028
Pusa giant Napier	792	784

11 Liming experiment

Objective: To study the effect of lime (pH) on the growth of Siratro on two soil types.

Initial laboratory studies showed that heavy additions of lime were required in both soils to sufficiently alter the pH. As a result the liming rates selected were 0, 20, 30, 40, 50 and 60 cwt per acre.

The experiment was harvested on four occasions and the total dry matter yield and the soil pH at the time of the final harvest are presented in Table 11.

A significant response to added levels of lime was recorded for both soils. The response was higher in the sandy soil than in the lateritic gravel soil.

Table 11. *Dry matter yield (g/pot) of Siratro and the soil pH in the pot at final harvest due to different levels of lime application in sandy and gravelly soils*

Soil and level of lime		*Dry matter yield*	*Soil pH*
Sandy soil	Ca_0	27.17	4.70
	Ca_{20}	61.40	5.75
	Ca_{30}	50.47	5.90
	Ca_{40}	64.20	6.15
	Ca_{50}	53.43	6.15
	Ca_{60}	51.90	6.50
Gravelly soil	Ca_0	29.23	4.40
	Ca_{20}	45.90	4.60
	Ca_{30}	47.63	4 70
	Ca_{40}	51.03	4.85
	Ca_{50}	58.30	4.60
	Ca_{60}	57.57	5.00

D. E. F. FERDINANDEZ
Officer-in-Charge