

EVALUATION OF GRASS AND LEGUME FORAGES ON
THE INTERMEDIATE SAVANNAHS OF MOBLISSA, GUYANA¹

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RTA

CARDI

The Intermediate Savannahs are located between 4° and 6° north latitude and between 57° and 57°30' west longitude. They lie about 96-144 kilometres from the coast at a height of some 25-30 metres above sea level and cover an area of approximately 9,842 square kilometres.

The area has a mean annual rainfall of 2000 mm, the distribution of which is bimodal and there is considerable variation in the rainfall pattern from year to year. The general trend is that there are two wet and two dry seasons, viz:

Long wet season - Mid April to Mid August
Long dry season - Mid August to Mid November
Short wet season - Mid November to End January
Short dry season - Early February to Mid April.

Mean annual temperature is 26°C with Diurnal fluctuation of up to 10°C. Highest temperatures of 34° have been recorded from August to November (corresponding with the long dry season). January, February and March are the coolest months with a mean temperature of 26°C.

Regional Trials A

Twenty-seven grass and legume species obtained from CIAT, and seven pasture legumes from the CARDI Antigua Evaluation and Seed Production Centre were planted in June 1982 (Appendix 1).

The seven pasture legumes from the Antigua accession failed to establish indicating failure to adapt to the acid, infertile soil conditions (Table 1). The CIAT accessions (which included three grasses and twenty-four legumes), established with varying degrees of success.

Evaluation of CIAT Accessions (Regional Trials A)

a. Legumes

Stylosanthes guyanensis: CIAT 1283 - attained excellent ground cover and vigorous growth. It appeared healthy except for a blackening of the stems due to Anthraxnose. This however did not appear to affect growth, and seed production has been good.

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2. CARDI, UWI Campus, St. Augustine, Trinidad, West Indies

Fig.1. Monthly rainfall (mm) for evaluation period June 1982 - Dec. 1983

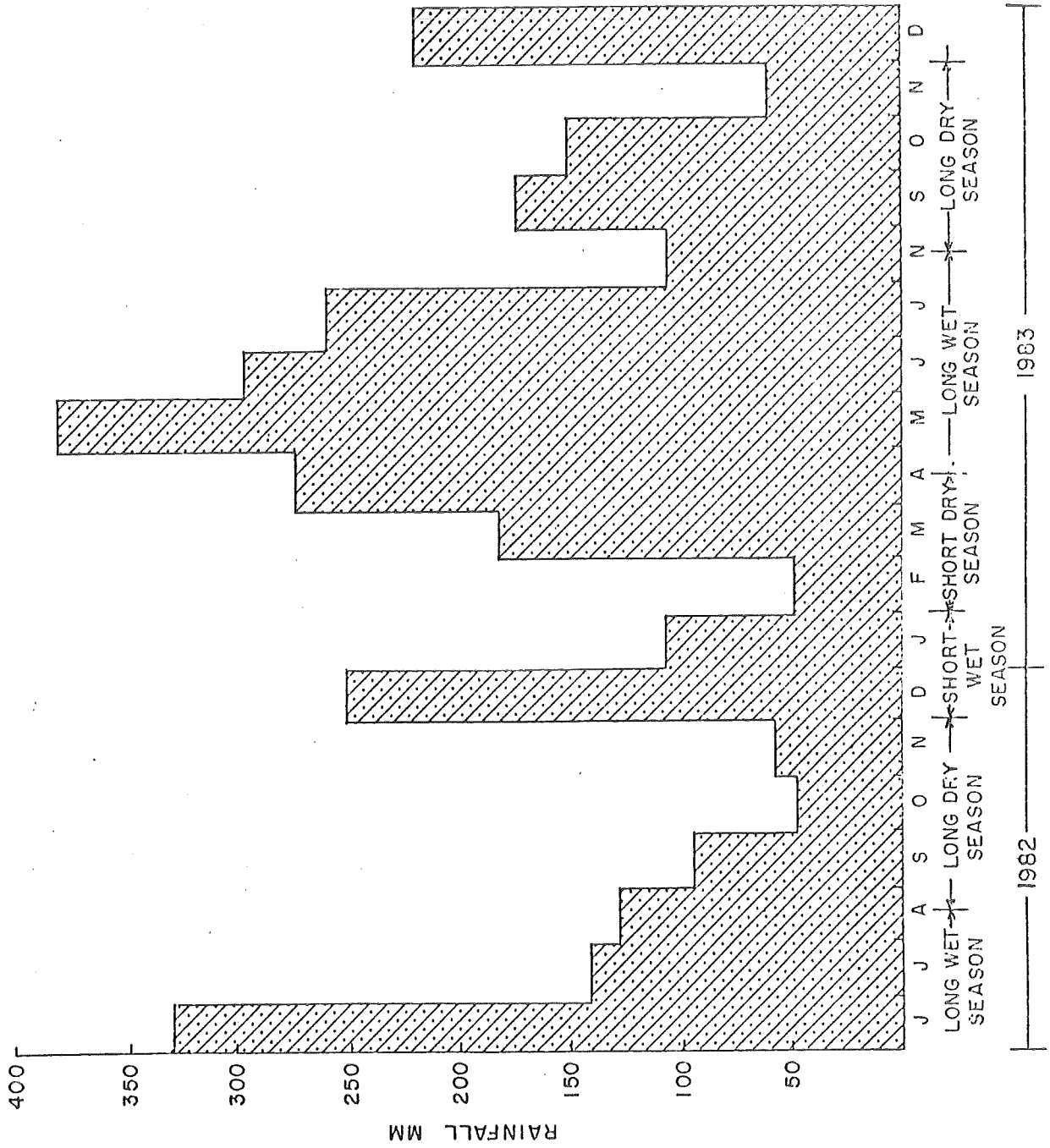


Fig. 2. Monthly rainfall (mm) for evaluation period July 1983 - August 1984

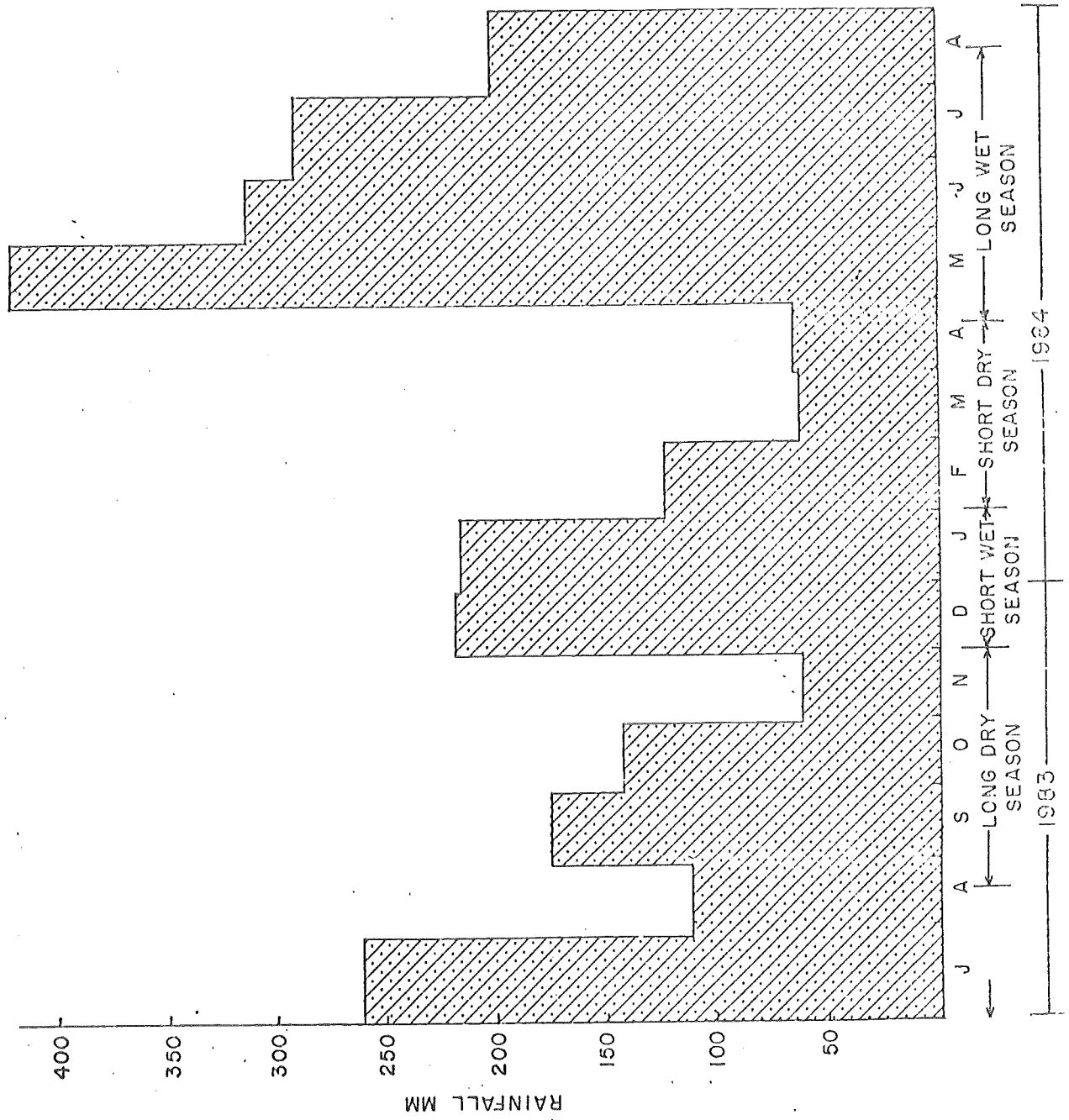


Table 1. - Physical and Chemical Characteristics of the "Brown Sand"
Soils of Moblissa, Guyana

| Depth cm | Particle size % | | | Elec. Cond mmhos /cm | pH | Exch Acid | Extractable Bases MEq/100ml soil | | | | | ECEC | Base Sat. % | Extr P | Extr. Micronutrients ppm | | | |
|-------------|--------------------|------|------|-------------------------------|-----|--------------|-------------------------------------|------|------|------|-------|------|-------------------|-----------|-----------------------------|-----|------|-----|
| | Sand | Silt | Clay | | | | Ca | Mg | k | Na | Total | | | | Cu | Mn | Fe | Zn |
| 0-12 | 93.3 | 2.3 | 4.4 | 0.00 | 4.6 | 0.44 | 0.00 | 0.12 | 0.02 | 0.05 | 0.19 | 0.63 | 30 | 18.90 | 0.06 | 0.0 | 340 | 0.4 |
| 12-20 | 92.7 | 4.1 | 3.2 | 0.00 | 4.5 | 0.24 | 0.00 | 0.00 | 0.03 | 0.00 | 0.03 | 0.27 | 11 | 21.00 | 0.60 | 0.0 | 700 | 0.6 |
| 20-40 | 90.1 | 5.9 | 4.0 | 0.00 | 4.7 | 0.32 | 0.00 | 0.08 | 0.04 | 0.00 | 0.12 | 0.44 | 27 | 16.80 | 0.80 | 0.4 | 720 | 0.8 |
| 40-80 | 88.4 | 7.7 | 3.9 | 0.00 | 4.9 | 0.36 | 0.10 | 0.12 | 0.03 | 0.10 | 0.35 | 0.71 | 49 | 8.40 | 0.60 | 0.0 | 400 | 0.4 |
| 80-120 | 85.3 | 10.3 | 4.4 | 0.00 | 5.0 | 0.16 | 0.00 | 0.00 | 0.03 | 0.18 | 0.21 | 0.37 | 57 | 0.00 | 0.40 | 0.0 | | 0.7 |
| 120-185 | 82.6 | 6.1 | 11.3 | 0.00 | 4.9 | 0.00 | 0.20 | 0.04 | 0.03 | 0.00 | 0.27 | 0.27 | 100 | 0.00 | 0.60 | 0.8 | 1100 | 0.4 |
| 188-200 | 81.3 | 5.4 | 13.3 | 0.00 | 5.0 | 0.24 | 0.10 | 0.04 | 0.02 | 0.10 | 0.26 | 0.50 | 52 | 0.00 | 0.60 | 0.8 | 1040 | 0.4 |

Desmodium ovalifolium: CIAT 350 - in early establishment showed a somewhat decumbent growth habit but became more erect with age. This species was severely attacked by the Acoushi ant (*Atta* species) which may have been the reason for the prostrate habit initially. It however went on to achieve excellent ground cover without any other pest or disease attack, but did show some signs of mineral deficiencies.

Centrosema pubescens: CIAT 5053 and 5136 - both of these ecotypes, though being slow to establish, produced excellent ground cover and showed vigorous growth. They however were affected by the *Rhizoctonia* foliar blight (RFB) caused by *Rhizoctona solani* and recovered slowly.

Centrosema brasialianum: CIAT 5065 - established slowly but produced excellent ground cover. It is among the more vigorous growing ecotypes. It was only slightly affected by RFB and showed tremendous ability to recover from this disease.

Stylosanthes capitata: CIAT 1693, 1318, 1342, 1728 and 1942 - although poor starters, they achieved good ground cover with time. These also showed varying degrees of Anthracnose infection but seed production was excellent.

Aeschynomene histrix: CIAT 9690 - established poorly but achieved some ground cover with time. This was probably due to its ability to reseed itself. Seed production was excellent. This ecotype did not show any incidences of disease attack, but was initially almost devastated by Acoushi ant (*Atta* species).

Pueraria phaseoloides: CIAT 9900 - was slow to start but once established produced excellent ground cover. It showed rather vigorous growth and did not seem to be affected by any pest or disease, except for signs of Magnesium deficiency. Seed production was regular.

Stylosanthes capitata: CIAT 2013, 2310, 1019, 1315 and 1405 - appeared to be ill adapted to the conditions. They exhibited poor vigour and failed to achieve full ground cover. Similarly *Stylosanthes lecocarpa*: CIAT 1087 was generally lacking in vigour.

Zornia latifolia: CIAT 9199, 728 and 9286 - while these ecotypes did establish well and attained good ground cover, they were severely attacked by sphaceloma scab, a fungus, resulting in defoliation and dieback of plants. The damage appeared severe enough to potentially devastate large acreages of these ecotypes.

Desmodium gyroides: CIAT 3001 - failed to establish adequately. The few plants present in the plots showed poor vigour and were defoliated by the Acoushi ant (*Atta* species).

b. Grasses

Bracharia decumbens: CIAT 600 - established fairly well and showed vigorous growth. No major pest or disease problem seemed to affect this ecotype. Seed production was good.

Andropogon gayanus: CIAT 621 - this took an extremely long time to establish by seed and in some cases replanting vegetatively was necessary. Once established it grew vigorously and achieved good ground cover. Large amounts of seed were produced and sprouting of new plants from seed fall was observed. The seeds have low viability.

Bracharia humidicola: CIAT 697 - this type showed vigorous growth after establishing quite rapidly. Maximum ground cover was achieved in a shorter period than the others. It did not appear to be affected by any major disease or pest and seed production was excellent.

APPENDIX

Germplasm Introduced and Screened on
CARDI/IDRC: Moblissa Project, Guyana

| <u>Legume</u> | <u>Obtained from</u> | <u>Accession No.</u> |
|-----------------------------------|----------------------|----------------------|
| <i>Stylosanthes capitata</i> | CIAT | 1693 |
| <i>Stylosanthes capitata</i> | " | 2013 |
| <i>Stylosanthes capitata</i> | " | 1318 |
| <i>Stylosanthes capitata</i> | " | 1342 |
| <i>Stylosanthes capitata</i> | " | 2310 |
| <i>Stylosanthes capitata</i> | " | 1019 |
| <i>Stylosanthes capitata</i> | " | 1315 |
| <i>Stylosanthes capitata</i> | " | 1405 |
| <i>Stylosanthes capitata</i> | " | 1728 |
| <i>Stylosanthes capitata</i> | " | 1943 |
| <i>Desmodium ovalifolium</i> | " | 350 |
| <i>Zornia latifolia</i> | " | 9199 |
| <i>Zornia latifolia</i> | " | 728 |
| <i>Zornia latifolia</i> | " | 9286 |
| <i>Stylosanthes leiocarpa</i> | " | 1087 |
| <i>Stylosanthes guyanensis</i> | " | 1282 |
| <i>Desmodium gyroides</i> | " | 3001 |
| <i>Centrosema pubescens</i> | " | 5053 |
| <i>Centrosema pubescens</i> | " | 5136 |
| <i>Centrosema brasilianum</i> | " | 5184 |
| <i>Centrosema brasilianum</i> | " | 5055 |
| <i>Centrosema macrocarpum</i> | " | 5065 |
| <i>Aeschenomene histrix</i> | " | 9690 |
| <i>Pueraria phaseoloides</i> | " | 9900 |
| <i>Teramnus labialis</i> | CARDI-Antigua | |
| <i>Centrosema</i> spp | " | |
| <i>Macroptilium atropurpureum</i> | " | |

| <u>Legume</u> | <u>Obtained from</u> | <u>Accession No.</u> |
|-------------------------|----------------------|----------------------|
| Desmodium gyroides | CARDI/Antigua | |
| Desmodium distortum | " | |
| Stylosanthes hamata | " | |
| Stylosanthes guyanensis | " | |

| <u>Grass</u> | <u>Obtained from</u> | <u>Accession No.</u> |
|-----------------------|----------------------|----------------------|
| Brachiaria decumbens | CIAT | 606 |
| Andropogon gayanus | " | 621 |
| Brachiaria humidicola | " | 679 |