

ABSTRACT

Studies on an adapted Louisiana Bank System of drainage, and its effect on some soil water relations and sugar cane growth were carried out on a sugar cane field in the Caroni Section of Caroni Limited. The soil type was the poorly draining, heavy Cunupia silty clay loam (aquic eutropepts).

Soil physical conditions of bulk density and penetration resistance increased, while percentage fine sand and non-capillary porosity decreased from the higher to the lower end of the field. The depth of rooting was also higher at the highest corner of the field by the middle of the wet period. There was no difference in rooting depth by the middle of the dry season. This was probably because roots were able to grow along cracks which developed in the soil profile.

Soil moisture and water table fluctuations indicated that some areas were better drained than others. The effect of high water tables and soil moisture contents on sugar cane growth and yield were however different depending on whether the areas were prone to inundation or not.

The areas prone to inundation were earmarked by means of a topographic survey. These areas of soil depressions were found to have shorter cane stalks, lower rates of cane growth and lower leaf nutrient levels than elevated and better drained sloping areas in the field. Sugar cane and sugar yields were also found to be

lower in the areas of soil depressions.

An application of nitrogen made at the end of the wet period when the plants were 6 months old, to boost growth and counteract the effect of waterlogging, had no effect on sugar cane leaf nutrient levels, growth or yield. This was probably because the succeeding rainfall was too low to facilitate the uptake and utilization of the nitrogen. The juice quality of cane stalks and sugar yield were also not affected by the application of nitrogen.

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