

A B S T R A C T

The effect of subsurface drainage at different spacings (10.5 m, 18.0 m, 22.5 m and no drains), and liquid feedlot manure on soil physical properties of the Piarco fine sandy loam (Aquiox Tropodult Ultisol) and the growth and yield of sugar cane (Saccharum officinarum L.) was investigated four years after the installation of the drains.

The investigation revealed a significant negative correlation ( $r = -0.64$ ) between bulk density and drain spacing at the 45-60 cm depth. Watertable and soil moisture content was lower in the drained fields than in the undrained; a significant negative correlation existed between drain spacing and watertable depth ( $r = -0.84$ ) and between depth to the watertable and soil moisture content at all depths studied. The drained cultivated field at the 18.0 m drain spacing had the tallest plants, highest root weight/cc of soil and highest yields in both ratoons. However, at the 9-month harvest of the second ratoon the undrained field had the higher average stalk weight.

Two applications of liquid feedlot manure, at ages 6 and 8 months, at two concentrations, (280 gm/litre and 140 gm/litre,  $S_2$  and  $S_1$  respectively) and at three levels (14, 28 and 42 tonnes  $ha^{-1}$ ,  $F_1$ ,  $F_2$  and  $F_3$  respectively) were made to sugarcane plants. There was no statistically significant differences between the two applications nor in soil hydraulic

conductivity among the treatments. Plots receiving the highest levels and higher concentration of manure ( $S_2 F_3$ ) had plants significantly taller than the control ( $C_1$ ) also N content was significantly higher than the control at age 8 and 10 months ( $P = 0.001$ ). Yield of standing cane was highest in treatment  $S_2 F_2$  at both age 8 and 10 months for both the single and double applications. However, the control had significantly higher percent Brix, than these two treatments.

At age 12 months treatments  $S_2 F_2$  and  $S_2 F_3$  were significantly higher than the control ( $P = 0.01$ ) for fresh weight yield  $ha^{-1}$  at the single application while for the double application treatment  $S_2 F_3$  was significantly better than the control ( $P = 0.001$ ) for the following:- average stalk weight fresh weight yield  $ha^{-1}$  and dry matter yield  $ha^{-1}$ .