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INFLUENCE OF MOLASS APPLICATION ON SOME SOIL HYDRAULIC CHARACTERISTICS AND INFILTRATION RATE, RELATED TO THE SOIL STRUCTURE

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ABSTRACT

A laboratory study was performed to evaluate the role of Molass using four levels (C=0, 10, 20 and 40 g kg^{-1}) on the water transport function [namely, penetrability (λ), sorptivity (S) and infiltration rate (i)] during transient flow in horizontal infiltration in Sandy loam soil incubated with Molass at 25 ± 2°C and 80% relative moisture content at 33 Kpa. For 60 days. Boltzmann transformation $\left(\lambda = x/t^{1/2}\right)$ was used to esitmate penetrability by fitting the wet front distance X vs. square root of time (t). Equation of **Philip (1957)** $\left(I = St^{1/2}\right)$ was used to estimate sorptivity (S) by fitting cumulative depth of water observed (I) vs. $t^{1/2}$. Infiltration rate (i) was calculated using equation $\left(i = \frac{1}{2} St^{-1/2}\right)$. The contact angle (α), soil surface free energy (γ_s) were measured and calculated for all soil treatments. We also studied the effect of Molass on aggregate stability from the values of Mean Wight Diameter (MWD) and Geometric Mean Diameter (GMD). Results showed significant response and decrease in all study water transport functions [(λ), (S) and (i)] with distance 30 cm of wetting front advance in end time with increasing the levels of Molass from 0.0 to 40 g kg^{-1}. Value of contact angle increased from 49.54 to 76.17, while the value of soil surface free energy decreased from 135.9 to 76.8 (m N m-1).

The addition of Molass played very important role in aggregate stability according to the value of MWD and GMD.

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