

COMPARISON OF CALIBRATION METHODS FOR NEUTRON MOISTURE GAUGE

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The neutron method for measuring soil moisture is especially suited for situations where changes in water content through the soil profile is of interest without resorting to destructive sampling. The accuracy of this method depends on the calibration whereby neutron counts can be accurately converted to moisture contents.

A study was undertaken to evaluate four different calibration methods and to propose a simplified method for Reddish brown earth soils of Sri Lanka. The two field methods include estimation of volumetric moisture for corresponding count ratios in different ways. One using soil core samples (gravimetric moisture with bulk density from the same sample) and the other by disturbed samples (for gravimetric moisture) with a common bulk density from the soil profile. The two laboratory methods include drum method and obtaining count ratios in standing water and the atmosphere (100% and 0% moisture respectively).

The results were analysed using a statistical package 'INSTAT' for comparison of regression. The four different calibration methods fitted best to four linear regression models with the same calibration coefficient (slope) but with different intercept constants. This shows the feasibility of combining laboratory calibrations to obtain the calibration coefficient with few field measurements to estimate the intercept constants.

Reference

1. Burn, R.W., Stern, R.D. and Knock, J. (1985). Introductory guide to Instat. Statistical Service Centre. University of Reading.