

Comparison of the performance of the Diviner 2000, EC-5 and CS620 probes to determine soil water content

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Summary

In rainfed agriculture it is fundamental to know the availability and spatio-temporal variation of the water content in the soil to evaluate the productivity of the crops. The present work presents an exploratory standardization methodology in the laboratory to characterize, calibrate and compare the records of three types of probes to measure humidity, in relation to the volumetric water content (θ_v) measured in the soil by gravimetry. The volume captured by the measurement of the probes, responses to temperature variation, particular calibration, among other aspects, are described. The probes evaluated were: Diviner 2000 Sentek (FDR), ECH2O EC-5 Decagon Devices (FDR), CS620 Campbell Scientific (TDR). The readings of the probes were notoriously sensitive to the working voltage, which makes it necessary to incorporate a voltage regulator to ensure the quality of the measurements. The temperature of the electronics of the sensors did not significantly affect the readings of the probe. The small volume measured allows the detailed study of microenvironments; this is why the measurement site must be chosen carefully, because the results may be affected by foreign materials in the soil or nearby cavities.

Key words: Soil moisture; capacitive probe; TDR; FDR