

many environmental factors such as soil types, as well as types and growing periods of the plant [24]. Therefore, the proposed method resulted in these studies would contribute to the sustainable crop production.

IV. CONCLUSIONS

The method developed in our studies applied a non-linear relation between soil water content (θ , in gg^{-1}) and soil electrical impedance (Z , in $\text{k}\Omega$) as follows: $\theta = a.Z^b$ where a and b are constants. Constants a and b should be determined in the laboratory prior to the field measurements. Therefore, the method was suitable to monitor temporal variations in soil water content. Parameter Z showed a good predictor for soil water content ($R \geq 0.90$) therefore can be used to determine soil water content in the field quickly. The dielectric method has been successfully used to determine the water balance in the vegetated soils, in which changes in soil water content caused by daily rainfall as low as 10 mm was detected up to the depth of 60 cm. The method was also successfully capable of calculating the amount of water used by palm oil nursery grown in media with different levels of soil organic matter. Differences in plant water use between organic matter treatments were also detected very well in these studies.

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