

Sakchai Laopakorn 2009; Development of Instrument to Measure Soil Moisture by Evaluating Electrical Resistance for Agricultural Purpose. Master of Engineering (Water Resources Engineering), Major Field: Water Resources Engineering, Department of Water Resources Engineering. Thesis Advisor: Associate Professor Kobkiat Pongput, Ph.D. 82 pages.

This thesis is to study in order to design and develop the original model to measure moisture in soil by evaluating electrical resistance for irrigation water. It can be set up in any arable farm land to determine moisture in soil layer where crops to be planted. The outcomes to be like the nature behavior of plant root soaking up water. It is used to allocate the irrigation water requirement of crops. The development of this device is an alternative for those who are looking to manage water in agricultural section.

The original device has been designed the measuring probe head to be a cylindrical shape of 2 cm. diameter with its end part shaped as 2 rods made from stainless to size, 0.4 cm. diameter 6.0 cm. length and spacing in between equaled to 1.4 cm.. The measuring head has been buried underground in the area where moisture to be determined. Moisture to be assessed in the form of electrical voltage after which the results to be compared using the table showing relation between electrical voltage and percentage of moisture in soil to determine the amount of moisture in soil.

Consequently, the study has found that obtained values from the device compared to moisture acquired from the experiment had the voltage lied between 0.5 and 4.0 volts. The inaccuracies are -6.26 %, RMS error being 0.27 and coefficient of correlation (r) exists 0.969. Regarding the examined parameters in laboratory where temperature and time to fill up water are controllable, reduction ratio of moisture (k) varied as to the temperature and seasonal stipulation, ie. k equaled to 0.856 for soil in winter as well as summer and 0.916 for those in rainy season.

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Thesis Advisor's signature

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