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Evaluation of Speedy Moisture Meter

A rapid and reliable method of determining soil moisture content in the field with a simple and portable apparatus is an important need in irrigation engineering and irrigation agronomy. Researchers have devoted much efforts in developing gravimetric, chemical, electrical, nuclear, penetrometer, tension and thermal methods for the determination of the moisture content of soils. A chemical method using calcium carbide as a reagent is showing great promise.

The principle involved in this method is that a given quantity of moisture will react with calcium carbide to produce a specific volume of gas (acetylene). The reaction is as follows: $CaC_2 + 2H_2O = Ca(OH)_2 + C_2H_2$. Based on this principle, a device was developed in England, consisting of a pressure vessel in which the gas produced from the reaction is made to activate the pressure gauge located in one end of the vessel. The gauge is calibrated to read the percentage of moisture directly, based on the wet weight of the sample.

TABLE 1. Comparison of moisture determination with moisture meter and gravimetric method.

Soil sample series tested	Moisture content (%) Wet Basis		Dry Basis	
	Speedy Moisture meter method	Gravimetric method	Speedy Moisture meter method	Gravimetric method
1.	17.8	17.8	21.5	20.5
2.	19.0	17.2	23.4	20.8
3.	16.0	13.5	19.0	15.6
4.	19.5	17.4	24.2	21.0

TABLE 1. Comparison of moisture determination with moisture meter and gravimetric method (*Contd.*)

Soil sample series tested	Moisture content (%) Wet Basis: Speedy Moisture meter method	Wet Basis: Gravimetric method	Dry Basis: Speedy Moisture meter method	Dry Basis: Gravimetric method
5.	15.2	13.8	17.8	16.0
6.	15.0	12.5	17.6	14.3
7.	11.7	9.2	13.2	10.1
8.	14.0	12.4	16.3	14.1
9.	19.6	19.1	24.3	23.6
10.	14.3	14.1	16.6	16.4
11.	19.4	17.8	24.1	21.6
12.	18.0	16.4	21.9	19.5
13.	14.9	15.7	17.5	18.6
14.	14.1	13.3	16.4	15.4
15.	17.0	16.3	20.4	19.6
16.	15.1	14.0	17.7	16.3
	'F' value = 1.89 (N. S.)		2.12 (N. S.)	

To compare the results of soil moisture determination of the calcium carbide gas pressure method to that of gravimetric method, a study was taken up in Tamil Nadu Agricultural University, with a series of soils having varied moisture content. The details are given in Table 1.

From Table 1 it is evident that the moisture estimation by speedy moisture meter does not vary significantly as compared to the conventional method *viz.*, gravimetric method. Thus the estimation of soil moisture by the calcium carbide gas pressure method is as good as the gravimetric method. It is advantageous over the later in the rapidity of moisture determination. On account of its easy portability, the field determination of soil moisture is rendered possible.

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