

Experiment No. 1

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Determination of Field capacity by field method

Field capacity is the moisture content in percentage of a soil on oven dry basis when it has been completely saturated and downward movement of excess water has practically ceased. Such a stage is reached generally in 48 to 72 hours after saturation. Sandy soils reach field capacity earlier than clayey soils. The downward movement of water continues even after this period for several days but the amount of water lost afterwards can be considered as negligible. Organic matter and fine texture increase the field capacity.

The field capacity is the upper most limit of available moisture range in soil water and plant relations. The force with which moisture is held at this point varies from $-1/10$ to $1/3$ of an atmosphere. However, $-1/3$ atm is taken as a general value for field capacity.

Materials:

1. Straw mulch or a black polythene sheet
2. Spade
3. Water
4. Soil auger Moisture boxes
5. Physical balance, and Drying oven

Procedure:

Select a representative spot in the field. Ensure that water table is not within two meters from the layer of which field capacity is to be determined. Bund an area of about 2.5 sq. metres on all four sides and remove all weeds to avoid transpiration.

Pour water till the desired layers gets sufficiently wet. Spread straw mulch of at least 40 cm thickness on the surface to prevent evaporation. A polythene sheet can be conveniently used instead of a mulch.

Take soil samples from different layers up to the root zone depth with auger and determine the soil moisture content at every 12 to 24 hours interval till the values of two successive samples

are nearly equal. Plot the moisture content versus time curve on a graph paper. The lowest influx value can be taken to represent the field capacity of the value for field capacity is less than that for maximum water holding capacity, since the later measures the moisture present in a fully saturated soil resting on a water table, so that the soil pores are completely filled with water.

Formula

$$\text{Percentage of soil moisture} = \frac{\text{reash wt} - \text{dry wt}}{\text{dry wt}} \times 100$$

The moisture percentage of a loam soil at 24 hours interval after saturation were observed as given below:

24 hours after saturation	48 hours after saturation	72 hours after saturation	96 hours after saturation
37.5%	28.7%	24.8%	24.7%

As in the above observation the moisture content after 72 hours is almost same as recorded at 96 hours. Therefore, the field capacity of the above soil is 24.8 per cent. It means that in this type of soil the field capacity reaches after 72 hours of saturation.

Practical significance

Conclusion

Signature of Faculty In-charge