

(3) Soil water :

Soil water is more important than any other ecological factors. Soil water is derived from Rain. When rain water falls on the soil losses through the following processes —

(i) Runaway water : Some part of the water drained away along the slope to the sea/River etc. called run-off water.

(ii) Evaporation : A few amount is evaporated back to the atmosphere again.

(iii) Some major Some part of the fallen water percolates through the soil and retains as —

(iii) Gravitational water : Due to gravity a portion goes down deep into the soil and retains as ground water. not available to the plants.

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(iv) Hygroscopic water or imbibed water :

It is the water kept absorbed or imbibed over the surface and inside the soil colloids. not available to the plants.

(v) Combined water : This water does not occur in free form but is bound up in chemicals, eg. $CuSO_4 \cdot 5H_2O$. not available to the plants.

(vi) Capillary water : This water in soil is mainly held between spaces (pore space) of the soil particles and angles between them forming a system of capillaries. This is the Capillary water is the chief source of absorption by the plants.

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6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

Field capacity : It is the maximum amount of water retained by a soil per unit of its dry weight after gravitational percolation has stopped. It is generally defined as the water content of an undisturbed soil after it is saturated by rainfall and drainage of gravitational water has completely stopped.

Moisture equivalent : It is defined as the water content (% over dry weight) retained by the undisturbed soil when about 30 gm of it are allowed centrifuge-drainage at 1000 gm for 30 minutes.



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Water holding capacity : The amount of water (%) retained by unit weight of dry soil when immersed in water under standardised condition.

Permanent wilting percentage or coefficient : It is the percentage of soil water in leaves of a plant growing in it first show permanent wilting.

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3	11	12	13	14	15	16
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17	25	26	27	28	29	30
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④ Soil Air :

The pore spaces of mineral particles are occupied by in addition to various liquids, by the gases. Soil air is generally richer in CO_2 as compared to atmosphere, as compared to atmospheric air. Oxygen is essential for micro-organism for making humus, N_2 fixation etc. It also required for earthworm and other soil fauna for respiration, metabolism, root growth etc.

⑤ Soil solution :

Plant nutrient in the soil are present as a solution. It has two component - organic matter and the chemicals. The soil having optimum nutrient is eutrophic and deficient in plant nutrient is oligotrophic.

- * oligotrophy is due to 3 reasons -
- (i) Leaching
 - (ii) Precipitation
 - (iii) Nature of parent rock.

In oligotrophy the vegetation is poor and sparse. Eutrophication is equally harmful because some are toxic at higher proportions (eg. Zn, Mo, Co etc)



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Soil organism :

A large number of organisms live inside the soil. They are bacteria, fungi, algae, parts of higher plants, protozoa, nematodes, insects, earthworms, burrowing vertebrates etc. which make the biological system of soil. Among these organisms, some help in maintenance of soil fertility through nitrogen fixation and others as decomposers returning nutrients back to the environment.