**Course: Water Management in Horticultural Crops 2(1+1),**

**Class: 1st year, 2nd semester**

**Topic: Rooting Characteristic of Plants regarding Moisture Absorption**

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**Rooting Characteristic of Plants regarding Moisture Absorption**

All plants do not have the similar rooting pattern i.e., root penetration and proliferation. Some plants have relatively shallow root system (for example annual crops), while others develop several meters under favorable conditions (for example tree crops). Crops with extensive and dense roots can utilize soil moisture more effectively and lower residual soil moisture than crops with sparse and shallow roots. The soil depth from which the crop extracts most of the water needed to meet its evapo-transpiration requirements and for higher productivity is known as effective root zone depth. Some examples of rooting depths of some annual crops on deep well drained soils are Peas 0.6 – 1.0 m, Soybean 1.0 – 1.5 m, Cauliflower 0.3 - 0.5 m, Tomato 0.7 – 1.5 m, Potatoes 0.4 – 0.6 m , Onion 0.3 - 0.5, Chillies 0.6 – 0.9 m, Maize 1.0 – 1.6 m and Cabbage 0.4 - 0.5 m etc.

**Factors Affecting Root characteristics:**

1. **Depth of Soil:** Root systems in the field are seldom uniform with depth. In a shallow soil, roots may be confined to a thin layer of soil irrespective of their usual pattern.
2. **Type of Soil:** Rooting depth of annual field crops on deep well drained soils range from 0.30 to 2.0 m.Generally, the root zone depth of crops on clayey soils is reduced by 2.5 to 35 % and on sandy soils increased by 2.5 to 35 %.
3. **Hard pan**: Root penetration is seriously affected by presence of a hard pan or compacted layer in the soil profile. Thus roots cannot penetrate a hard layer except through cracks.

**(4)Available** **Soil moisture**: Since roots cannot grow in soil that is depleted in

moisture down to and below the permanent wilting point, a layer of dry soil below

the surface in the profile can restrict root penetration.

1. **Water table**: A high water table limits root growth, and a rising water table may kill roots that have previously grown below the new water level.
2. **Toxic substances:** Presence of toxic substances in the sub-soil also limits root growth and development. Saline layers or patches in the soil profile inhibit or prevent root penetration and proliferation.