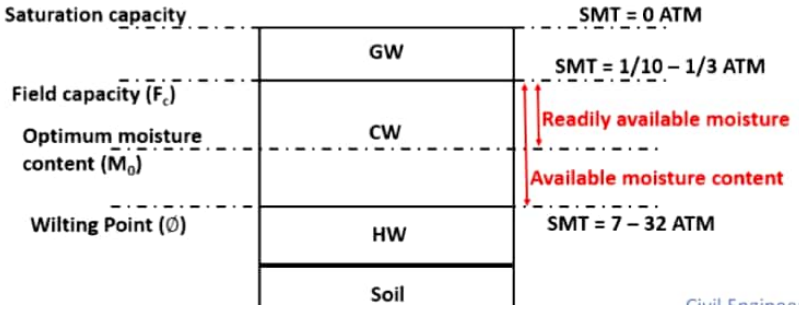
2. Field capacity (F_c)

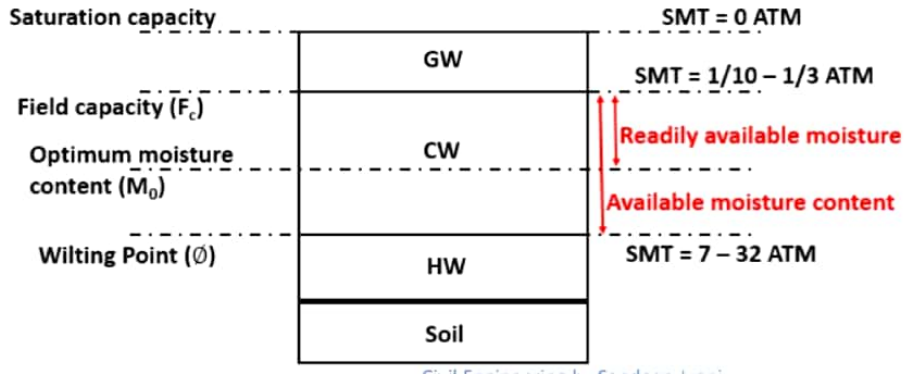
- → it is the maximum water which can be held by the soil against gravity
- → It depends on porosity and capillarity
- → Moisture content at field capacity includes hygroscopic water & capillary water
- Note: Irrigation water has to be supplied to the crops when the moisture level falls 'below wilting point'

$$F_c = \frac{wt\ of\ water\ retained\ in\ certain\ volume\ of\ soil}{wt\ of\ same\ volume\ of\ dry\ volume\ of\ soil}$$



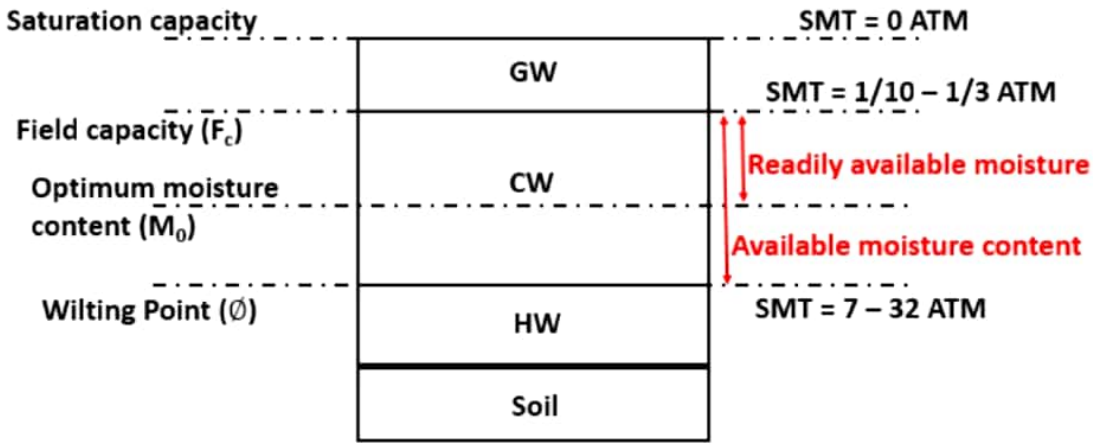
3. Wilting point /permanent wilting point (Ø)

- → Wilting point is the moisture content below which plant can no longer extract moisture from the soil for its growth
- → at this moisture content plant leaves will wilt
- → permanent wilting point depends on nature of soil
- → permanent wilting point is the lower limit of capillary water & upper limit of Hygroscopic water.



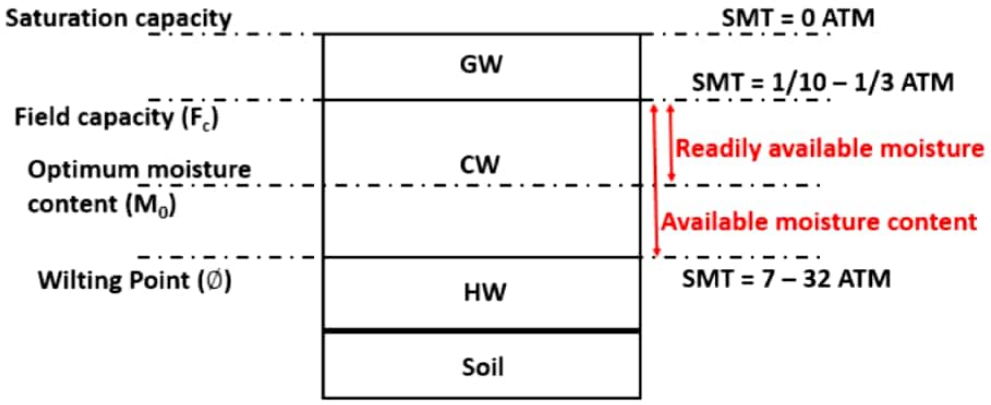
4. Available Moisture Content

- → it is difference of field capacity (Fc) and wilting point (Ø), it is the water available for the growth of crops
- → it is also called as 'Maximum storage capacity of the soil'.



5. Readily Available Moisture Content

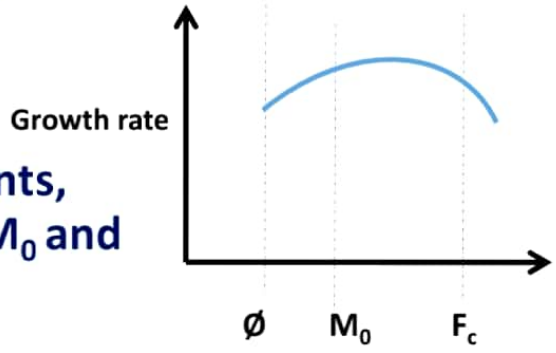
- → It is that portion of available moisture which is most easily extracted by the plants and such a limit is called 'Optimum moisture content' (Mo)
- → In absence of data, we can assume readily available moisture content = 75% of available moisture content



Soil Moisture deficiency/Field Moisture deficiency

- **Soil moisture deficiency is the amount of water which is to be added to the soil such that moisture content is raised to field capacity.**

- **For healthy or optimum growth of plants, moisture is allowed to fall only up to M_0 and not up to wilting point Ø**



Moisture Equivalent

- **Moisture equivalent is defined as percentage of moisture retained in 10 mm thick saturated sample of soil subjected to a centrifugal force of 1000g for a period of 30 minute .**
- **It can be quickly determined in laboratory and gives very good indication of Fc**

1/3rd Atmosphere moisture point

- **It is percentage of moisture retained in soil sample when placed on a porous plate subjected to atmosphere pressure of 1/3rd atmosphere.**
- **It also provides a good estimate of Fc.**

Depth of water held in root zone

For Ease in calculation, water present in voids of the soil needs to be expressed as depth of water

- **Let , root zone depth = 'D' m**
- **Specific wt. of dry soil = γ_d**
- **Cross-sectional area of the soil considered = A**
- **Equivalent depth of water present in voids of the soil = d m**

$$F_c = \frac{wt\ of\ water\ in\ certain\ volume\ of\ soil}{wt\ of\ same\ volume\ of\ soil}$$

$$\Rightarrow F_c = \frac{A \times d \times \gamma_w}{A \times D \times \gamma_d}$$

$$\Rightarrow d = \frac{\gamma_d}{\gamma_w} \times D \times Fc$$

- If is the depth of water stored in the root zone for full field capacity but, this entire depth of water cannot be extracted by the plants, hence available moisture content will be given as;

$$d = \frac{\gamma_d}{\gamma_w} \times D \times (Fc - \emptyset)$$

- Equivalent depth of water readily available,

$$d = \frac{\gamma_d}{\gamma_w} \times D \times (Fc - M_0)$$