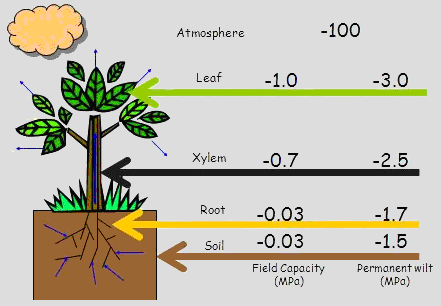
**Water Potential Theory**

Water potential is a measure of the difference in potential energy between the water in a sample and the water in a reference pool of pure, free water. Free water has a potential of zero by definition.  Since soil water generally has an energy state lower than that of pure free water, its potential usually has a negative value. The energy of soil water can be changed by changing the pressure of the water (pressure potential), changing the concentration of solutes in the water (osmotic potential), or by the adhesive and cohesive forces that bind water to solid surfaces and in capillaries of a matrix (matric potential). The energy of soil water also depends on the position of the water in a gravitational field (gravitational potential).



Differences in water potential drive water movement from the soil to the atmosphere

1) General equation**: Ψw = Ψs + Ψm + Ψp + Ψg**

2) Soil equation **: Ψw = Ψs + Ψm**

3) Plant equation**: Ψw = Ψs + Ψp**

4) Vapor pressure deficient**: VPD = es – ea , RH = ea/ es**

5) **Ψair = - 1.06\* T \* Log 100/RH**

6) **Ψs = - iCRT**, (i= Solute ionization, C= Solute concentration mole/l) **,** (T=273 + oC, R= 0.00831)