

Section 8 of 22 (8h - Table of Important Equations, Relationships and Concepts used in IWM)

<p>Irrigation planning:</p>	<p>TDS (ppm) = EC_{iw} (dS/m) x 640 (for EC_{iw} between 0.1 & 5.0 dS/m; calculates Total Dissolved Solids). Used to assess salt load in irrigation water.</p> <p>TDS (ppm) = EC_{iw} (dS/m) x 800 (for EC_{iw} > 5.0 dS/m; i.e., irrigation waters with high salt content).</p>	<p>LF = Leaching Fraction. A LF = 0.1794/Fc^{3.0417} is used for High Frequency Irrigations</p> <p>NIR = Net Irrigation Requirement</p> <p>ET_c = Crop Evapotranspiration (crop consumptive use)</p> <p>IWM = Irrigation Water Mgmt.</p> <p>E_a = Irrigation Application Efficiency</p> <p>F_g = Gross Irrigation Application</p> <p>Q = DA/T: Where Q = cubic feet per second (cfs); D = inches applied; A = area in acres & T = time in hours</p> <p>SAR = Sodium Absorption Ratio</p> <p>TDS = Total Dissolved Solids (the amount of solid minerals dissolved in water)</p> <p>ppm = parts per million</p> <p>dS/m = decisiemens/meter (electrical conductivity)</p> <p>D_b = Soil bulk density in grams per centimeter cubed (g/cm³)</p> <p>CEC = Cation Exchange Capacity in milliequivalents per 100 grams (meq/100 g) of soil, on a dry weight basis</p> <p>AWH = Available Water-Holding Capacity in inches of available water per acre-foot of soil</p>
<p>F_c = EC_{e(ct)}/EC_{iw} (calculates the ratio of the soil salinity to irrigation water salinity). Is needed to calculate the Leaching Fraction (LF)).</p> <p>LF = 0.3086/Fc^{1.702} (calculates the LF for conventional irrigation). Accounts for extra water needed for salt mgmt.</p> <p>NIR = ET_c/(1 – LF) (calculates the Net Irrigation Requirement (NIR)). Used to plan & design irrigation systems & IWM Plan.</p> <p>E_a = Irr. needed/Irr. applied (calculates the Irrigation Application Efficiency (E_a)). Used to evaluate irrigation system efficiency & IWM Plan.</p> <p>F_g = NIR/E_a (to calculate Gross Irrigation Application needed (F_g)). Used in the planning & design of irrigation systems and IWM Plans.</p> <p>Q = DA/T (to calculate the amount of flow (cfs) needed per border/field). Used in the planning and design of irrigation systems and evaluation of IWM Plans.</p>	<p>Soils:</p>	
	<p>D_b = g/cm³ (calculates the soil bulk density). Used to assess soil compaction, available water & soil porosity as they relate to soil texture & structure.</p> <p>CEC = meq/100 g (is based on % clay & % OM). Is used as an indicator of the soils capacity to retain nutrients and its buffering capacity).</p> <p>AWH (inches/foot): is based predominantly on soil texture. Used in the development, implementation & monitoring of an IWM Plan.</p>	
	<p>Definitions:</p>	
	<p>F_c = Ratio of soil salinity to irrigation water salinity</p> <p>EC_{e(ct)} = Electrical Conductivity of soil saturation extract (i.e., the Crop Threshold Salinity in dS/m)</p> <p>EC_{iw} = Electrical Conductivity of the Irrigation Water (dS/m)</p>	
<p>Water Quality:</p>		
<p>SAR = Na/√(Ca + Mg)/2 (calculates the Sodium Absorption Ratio). Used to evaluate potential infiltration problems (SAR & EC_{iw} are used together in this evaluation).</p>		