Guidelines for interpreting laboratory data on the suitability of irrigation water for

SALT SENSITIVE DECIDUOS TREE CROPS

(Almond, Apple, Apricot, Cherry, Peach, Pear, Walnut)

(acceptable range for pH: between 6.5 – 8.4)

The Problem and related constituents	No Problem	Increasing Problem	Severe problem[5]
Salinity: stunts tree growth & reduces yield			
ECw[1] (dS/m or mmhos/cm)	<1.1	1.1– 3.2	>3.2
ECw[1] (uS/cm)	1100	1100 – 3200	> 3200
TDS[2] (mg/L or ppm)	<700	700 - 2000	> 2000
Permeability: affects the rate of water movement into and through soil.			
When: SAR[3] = 0-3 and ECw =	> 0.7	0.7 - 0.2	< 0.2
SAR = 3-6 and ECw =	> 1.2	1.2 – 0.3	< 0.3
SAR = 6-12 and ECw =	> 1.9	1.9 – 0.5	< 0.5
SAR = 12-20 and ECw =	> 2.9	2.9 – 1.3	< 1.3
SAR = 20-40 and ECw =	> 5.0	5.0 – 2.9	< 2.9
Toxicity[4]: specific ions that can injure and affect tree growth during surface irrigation			
Sodium (meq/l)	< 3.0	3.0 – 9.0	>9
Sodium (ppm or mg/l)	< 70	70 - 200	>200
Chloride (meq/l)	< 4	4 - 10	>10
Chloride (ppm or mg/l)	< 140	140 - 350	> 350
Boron (ppm or mg/l)	< 0.5	0.5 - 3	> 3

Notes:

[1] **ECw** = Electrical Conductivity of water. This is a general measure of the overall salinity of water. It is typically reported in units of milli mhos per centimeter (mmhos/cm), deciSiemans/meter (dS/m) or microSiemans/centimeter (uS/cm) ; dS/m x 1000 = uS/cm and dS/M = mmhos/cm.

[2] **TDS** = Total Dissolved Solids is another measure of overall salinity and is measured in (mg/L) or (ppm). *Conversion**: Divide TDS (mg/L or ppm) by 640 to get EC (dS/m) (*this is only accurate if the EC is < 5 and the sulfates are not excessive)

[3] **SAR** = Sodium Adsorption Ratio. Calculated by the testing lab from the relative amounts of sodium, calcium, magnesium in water: SAR = Na^{+}/sq.root of (Ca^{2+} + Mg^{2+} /2)

[4] Individual ions may be reported either as milliequivalents per liter (meq/l) or parts per million (ppm); Parts per million is the same as milligrams per liter (mg/l)

[5] Special management practices and favorable soil conditions are required to successfully produce trees with water of this quality. Not suitable for typical agricultural use.

Include the nitrogen applied with your irrigation water when planning your fertilizer program so you don't apply too much. Multiply nitrate-nitrogen by 2.7 to determine the pounds of nitrogen per acre-foot of water.

Excerpted from: **Agricultural Salinity & Drainage**, University of California Agriculture & Natural Resources Publication 3375, 2006 – available from: http://anrcatalog.ucdavis.edu

Other UC Resources:

- **Irrigation Water Salinity and Crop Production**, University of California Agriculture & Natural Resources Publication 8066; download for free from http://anrcatalog.ucdavis.edu
- **UC Drought Management Website**: http://ucmanagedrought.ucdavis.edu/
- **CA Institute for Water Resources Website**: http://ciwr.ucanr.edu