

Avocado Irrigation – Special Topics

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Water Supply

- We live in a desert, most of our district water is delivered from the Colorado River
- The State Water Project (water originating from the Sacramento Delta) was designed to supplement the supply
- Drought years in the early 1990's and 2007 to 2010 (and continuing) forced water cutbacks to farming in S. Calif.
- Groves are in peril! 30% cutback to growers during droughts

Water Quality - Salinity

- Avocado is the most sensitive to salinity of all the tree crops grown in California
- Excessive salts (especially the chloride ion) causes “tip-burn”, which leads to leaves falling during the winter and spring, which results in poor flowering and fruit set in the late spring
- Salinity is measured in TDS (total dissolved solids)

Salinity

- Measured in TDS. TDS of 1.0 = 640 ppm or 640 mg/L
- District water is generally TDS of 0.7 (but 0.9 has been seen as the drought progresses)
- A TDS of 1.5 in a reclaimed water trial reduced avocado yield by 40%

How does salt reduce yield?

1. Osmotic potential in the soil increases when salts accumulate. Water wants to flow in direction of higher salt concentration. In extreme cases, water will flow out of roots into the salty soil, wilting plants.
2. Sodium may accumulate in soil, displacing calcium and magnesium. Soil structure deteriorates, resulting in poor water penetration into soil.
3. Uptake of chloride, which is toxic to avocado

Lab Reports

- EC e = electrical conductivity of the soil extract
- EC w = electrical conductivity of water
- Yield reductions (see handout)

How do you manage salinity?

1. Use the best source of water available

2. Leaching

1. Calculating the leaching requirement

$$LR = EC_w / (5EC_e - EC_w)$$

$$LR = 0.9 / (5 \times 1.3 - 0.9)$$

$$LR = 0.16$$

Or, 16% extra water should be applied during each irrigation

Managing Soil Salinity

3. Soil Monitoring
4. Blending water
5. Irrigating more frequently
6. Rootstocks (West Indians are less salt sensitive, Mexicans are more salt sensitive)
7. Manures and mulches, apply them in November (let the rain leach out the salt)
8. Watch the SAR (sodium adsorption ratio), should not go over 5