

# Avocado Irrigation

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## Special Challenges in Avocado Irrigation

1. Avocado has a shallow irrigation system, 80-90% of the feeder root length is located in the upper 8-10 inches of rootzone soil
2. The feeder roots are rather inefficient at water absorption because they have very few root hairs, and soil moisture is consumed rapidly in the upper layer of rootzone soil.
3. Many of the groves are on hillsides with a decomposed granite composition. These soils drain rapidly (which is good), but at the same time they don't store a lot of water.
4. Therefore, the irrigator must be diligent at checking soil moisture with tensiometers, soil moisture meters or soil probes, and re-supplying the soil water before the trees become stressed
5. Some groves are on heavy soil (high clay content). These groves often suffer from poor drainage and low oxygen content in the soil pore spaces resulting in direct damage to the roots and increased spread of avocado root rot.

## Heavy Water Users

1. **Avocados are fairly heavy water users in S. Calif. where water is expensive (Fallbrook water is about \$1100/acre feet, and a grove needs about 3.5 – 4.0 acre feet per acre).**
2. **The trick is to supply water to the trees that meets the needs of the trees, not to stress the trees by irrigating infrequently, and not to waste the water by over-irrigating**
3. **At the same time there must be some over-irrigation periodically to leach the salts out.**

## Scheduling – We need to know 2 things

1. **Frequency** (How often do we irrigate?)
2. **How much** (to apply during an irrigation)

## Frequency

1. **Rule of thumb: water should be applied at about 30% moisture depletion in the soil.**
2. **The best method is to use a tensiometer or a Watermark (gypsum block attached to electrodes)**

3. In the sandy loam soils of San Diego and Riverside County hillsides, 30% moisture loss is about 20 cb on the tensiometer (set at 8 inches below the soil surface)
4. A deeper tensiometer set at 2 ft can tell you when to turn the water off.

## How much to apply

1. We use CIMIS stations to help us figure this out (see the handout on how to use CIMIS)
2. This chart is a calculation for the amount of water per day used by mature avocados based on the Escondido CIMIS station

	<i>Monthly ETo</i>	<i>Daily ETo</i>	<i>Kc</i>	<i>Daily ETc</i>	gallons/day (20' x 20' spacing)	gal/day plus 10% leaching fraction	gal/day plus leaching divided by 0.80 DU
<b>Jan</b>	2.53	0.082	0.86	0.071	17.5	19.3	11.3
<b>Feb</b>	2.66	0.095	0.86	0.082	20.4	22.8	16.5
<b>Mar</b>	3.91	0.126	0.86	0.108	27.0	29.7	23.6
<b>Apr</b>	5.34	0.178	0.86	0.153	38.1	41.9	33.6
<b>May</b>	6.12	0.197	0.86	0.169	42.2	46.4	40.4
<b>Jun</b>	6.88	0.229	0.86	0.197	49.1	54.0	51.1
<b>Jul</b>	7.34	0.237	0.86	0.204	50.8	55.9	52.8
<b>Aug</b>	7.00	0.226	0.86	0.194	48.4	53.2	50.4
<b>Sep</b>	5.49	0.183	0.86	0.157	39.2	43.1	37.7
<b>Oct</b>	4.21	0.136	0.86	0.117	29.1	32.0	25.7
<b>Nov</b>	3.00	0.100	0.86	0.086	21.4	23.5	18.9
<b>Dec</b>	2.48	0.080	0.86	0.069	17.1	18.8	13.7