



## Field Observed Salt Tolerance of California Pistachios

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The general concept of crop salt tolerance is over simplified: consisting of a single soil saturation extract salinity threshold with a “% relative yield” decline function. This approach minimizes the real world variability in actual tree growth and yield due to additional specific ion toxicity and soil texture/anoxia. The current salinity tolerance function for California pistachios is essentially the same as cotton. It was developed from a small plot study in an 8 to 13 year old orchard in northwestern Kern County from 1997-2002 with a threshold of 9.4 dS/m ECe and an 8.4% relative yield decline above that level. These values were confirmed for seedling growth in saline sand-tank studies at the USDA Salinity Lab in Riverside, California. A second large scale field study applied fresh and saline irrigation treatments (0.5 to 5.2 dS/m EC) from planting through 10th leaf. Trees were commercially harvested starting in 2011. Average 2011-14 root zone salinity ranged from 2.5 to 13.2 dS/m and caused a significant edible inshell yield reduction of 108 to 264 kg/ha (depending on rootstock) in the combined 4 year yield: a ~1 to 3% decline for every unit EC (dS/m) increase over 6 ds/m. A greatly expanded salinity survey including 10 commercial fields (9th – 15th leaf) in western Kern County with 140 individual tree data points ranging from an average root zone (1.5 m depth) salinity of 1.6 to 20.5 dS/m resulted in a similar yield reduction of 162 to 394 kg/ha (3 year cumulative inshell yield) for every unit ECe > 6.5 dS/m.

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