

Large-Scale Utilization of Saline Groundwater for Development and Irrigation of Pistachios Interplanted with Cotton

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Executive Summary

Project Relevance

Numerous laboratory and field trials over several decades have proven cotton to be capable of using saline irrigation water (up to 8 dS/m) without compromising yield. More recent studies indicate that pistachios may have a similar tolerance level. Typically, these studies have been conducted in sand tanks and small field plots, and with a few exceptions, growers in the San Joaquin Valley have been reluctant to implement these strategies on a large-scale. Significant increases in management and potential salt buildup that would damage some rotation crops are major concerns and sufficient incentive to use such water is not there if fresh canal water is available at an affordable price (<\$70/ac-ft).

At the same time, subsurface drip irrigation systems (SDI) with hard hose or tape have proven the most efficient and uniform method for irrigating cotton and possibly avoiding some soil structural problems that can result from using saline water for surface irrigation. But these systems were more costly 10 years ago and rarely the most profitable compared to furrow irrigation on heavy soils.

Current water costs on the Westside now range from \$60 to \$160/ac-ft in an average water year depending on the irrigation district. Canal water availability has decreased while at the same time the cost of SDI tape systems has declined significantly compared to the price 10 years ago. The

combination of all these factors now provide sufficient economic incentive for growers to seriously consider large-scale plantings of cotton and pistachios to utilize water supplies previously deemed unsuitable for San Joaquin Valley production agriculture.

Objectives

1. Assess the economic profitability of large-scale cotton production over four years using saline shallow groundwater (EC 3.5 dS/m and B @ 8 ppm) and optimal irrigation scheduling with SDI.
2. Using the same water, establish a new pistachio orchard interplanted with cotton starting the second year. Determine crop ET for this system and impact of salinity.
3. Maintain acceptable soil salinity levels for cotton stand establishment/production and maximum growth of young pistachios.
4. Compare total project profitability under SDI using 3 different levels of salinity: saline water, non-saline CA Aqueduct water and a 50/50 blend. Compare the economics of drip tape SDI with typical Belridge Water District cotton production using sprinklers.