

## Water Supplies for San Diego's Avocados - Some Thoughts about the Future

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Those in the avocado industry have come to expect a lot from their irrigation water. It must be readily available, be pressurized, be of good quality and (importantly) be relatively cheap. Water is used to leach out salts and carry fertilizers; but we don't want too much of it filtering unused past the roots, and we don't want it to run down the hill—this can spread root rot.

We've learned in recent years how to apply water on steep terrain so that the tree at the bottom of the hill (in a gully) receives the same amount of water as the tree at the top of a rocky ridge. We've learned that, because of the avocado's shallow, tender root system which evolved in the jungles of Central America, we have to water the trees fairly often; their shallow root systems preclude the effective use of water stored at deeper depths in the soil. We are in the process of learning how to use CIMIS to schedule irrigations correctly, aided by crop coefficients developed at the University's test plot in Corona.

Unfortunately, we have also learned that avocados can use a lot of water; 40 gallons per mature tree per day is normal in the summer, zooming to 60 gallons during Santa Ana winds. Given the fact that 90% of irrigation water in San Diego County is imported from northern California and the Colorado River, we should ask some questions: "Will the water always be there when we turn on the valve?" and "Can we afford the water that is available?"

### **WATER PROBLEMS**

#### **The Supply — Short Term**

At the time of this writing, (January, 1989), California has experienced two winters of below normal precipitation and snowpack. The Metropolitan Water District has informed local water districts that they may expect a cutback in water delivery after June 1989 if the 1988-89 winter remains dry. To make us a little more nervous, the farm advisors in San Diego were recently interviewed by the Department of Water Resources; their questions included, "What would happen to avocado production if water supplies were to be cut 50% or 100% in 1989?" (Our answer, of course, was that we should expect almost total crop failure and severe dieback, even at 50% cutback.)

Are avocado growers in the middle of a water crisis? At this point, we don't know for sure. The Department of Water Resources reports that, as of January 1989, snowpack water holding content is 110% of normal and precipitation is about average, but reservoir storage is 4.9 million acre feet below last year. Apparently, the storms of 1988-

89 are not concentrated enough to cause sufficient runoff to fill reservoirs. On the positive side, Colorado River reservoirs are filled to capacity and may help agriculture get through 1989. In some respects, southern California is better off than northern California; we have large reservoirs on the Colorado in addition to the State Water Project. San Francisco, for instance, has been relying almost totally on the meager snowmelt from the Sierras draining into the Tuolumne River.

### **The Supply — Long Term**

Southern California was dealt a blow in a 1964 Supreme Court decision in which dependable supplies of Colorado River were reduced 55 percent; Arizona would be allowed to acquire their full share at the completion of their water projects. The State Water Project has not been able to supply southern California with their full entitlement, mainly due to perceived (and perhaps real) environmental and political misunderstandings. A recently proposed plan from the State Water Resources Control Board would limit deliveries to southern California to 1985 levels, one third the amount of the contract. The reason? To supply more fresh water to San Francisco bay to increase fish population.

Given that Arizona will be taking increasing amounts of water from their allotment of the Colorado River, and the State Water Project may have problems delivering southern California's full entitlement from the Delta, agriculture in southern California will face certain cutbacks at some point in time, as the urban population demands begin to cut into the agricultural supply.

The population of 2,002,000 in San Diego County in 1985 used 545,214 acre feet of water (433,331 municipal and industrial, 111,883 agricultural). The population is expected to increase to 3,059,900 in the year 2010, with an expected water demand of 793,200 acre feet (673,200 municipal and industrial, 120,000 agricultural).

Where are the sources of extra water? Table A presents the scenario from the San Diego County Water Authority for the year 2010.

From Table A we can see that the Water Authority is hopeful that several radical changes will occur in our water supply during the next 20 years. They assume that (1) Metropolitan Water District will complete a deal to line the irrigation canals in Imperial County (we would purchase the water saved), (2) a major effort to use reclaimed water will occur (this includes building separate storage facilities and water transfer systems, and (3) an affordable energy source can be found to desalinate ocean water (atomic energy?). A conservation effort would provide 10% cushion during drought years.

**TABLE A**  
**Expected water supply for San Diego County in the year 2010.**

%	Source	Acre Feet
65.5	Metropolitan Water District (with supply effort consisting of exchange with Imperial Irrigation District and others)	524,200
7.5	Local	60,000
12.5	Reclaimed Water	100,000
4.5	Desalination	35,800
10.0	Conservation (reduction in demand)	80,000
	Total:	800,000

The problems are obvious with desalination and the moving of reclaimed water around the county, but water marketing appears to offer real promise for increasing water supplies in the near future. Metropolitan and the Imperial Irrigation District have recently reached an agreement whereby the Metropolitan Water District would pay Imperial Irrigation District \$92 million over the next 35 years to line canals and other facilities; \$23 million for indirect costs and \$3.1 million per year for operation and maintenance. In return, MWD would acquire 100,000 acre feet of water saved each year, enough to meet the needs of 500,000 urban dwellers.

### **Water Cost**

Although the Water Authority is hopeful of providing water for all of our needs during the next 20 years, we have to wonder about the cost.

In the effort to bring water to southern California, some expensive bills have been incurred. Municipal, industrial, and agricultural water users must all share in paying for dam and aqueduct construction, pumping, and maintenance costs. Even though agriculture gets a slight break on the price, it is probably safe to say that water in San Diego County is more expensive than any place in the nation.

In a survey conducted in 1986, agricultural water averaged \$315 per acre foot, with some districts at higher elevations approaching \$500 an acre foot. If the grower uses 3 acre feet/year, the cost of water would be close to \$1000 an acre. The average yield in San Diego County was 7000 pounds in 1985. At an average 5 year return (as of 1986) for Hass avocados at \$0.35 per pound, gross income would have been \$2,450 per acre; water costs in this case would represent 40% of gross income.

It will be very difficult, if not impossible, for commercial avocado production to continue to sustain such high water costs, expected to increase as we develop alternative sources of water.

One possible alternative would be rapidly to develop reclaimed sewage water for agricultural use. Another avenue of thought would be to have the citizens of San Diego County pay more for urban water in order to keep viable agriculture in the county.

Would the urban sector be willing to partially subsidize water costs? In order to answer this question, a survey of water users in the county was conducted in 1986 by Cooperative Extension county director B. Diane Wallace, farm advisor Herb Weisheit, and specialist Bill Woods. Ten thousand questionnaires were mailed to a randomly selected mailing list; two thousand were returned, indicating a significant interest (10 percent return rate is normal for questionnaires).

The primary question asked was, "Do you think something should be done to keep San Diego County agriculture from being hurt by rising water costs?" Eighty seven percent responded affirmatively.

The next question was: "If yes: Do you think agriculture should be protected even if it meant paying:

	<u>Yes</u>	<u>No</u>
\$1 a year more for your water	80%	20%
\$5 a year more for your water	70%	30%
\$25 a year more for your water	40%	60%
\$50 a year more for your water	19%	81%''

The actual responses suggest a willingness to pay. However, since a positive response was costless at this stage, the magnitude of dollar amounts were much less significant than was the rather clear interest in the subject.

From both an educational and a political perspective, citizen interest in agriculture in San Diego County, and an indicated willingness to attach dollars to that interest, suggests an opportunity to bring about better communication and an understanding between agricultural operators and urban residents.

A citizen interest in preserving agriculture for their "quality of life" may play a decisive role in the preservation of avocado production until the year 2010.