



AGRICULTURAL WATER USE EFFICIENCY vs. WATER TRANSFERS

One of the management strategies for reducing water demand in the 2009 CA Water Plan Update is “Agricultural Water Use Efficiency” (WUE). Inefficient water use is presumed to be a problem with irrigation technology and crop choice, but State planning which promotes inefficient agricultural water use is being ignored.¹

Comparing water requirements for the same crop, almonds, grown at either end of the Central Valley demonstrates that neither economics nor efficient use supports the policy of transferring agricultural water from north to south.²

The southern San Joaquin Valley has long, dry summers which mean less frost damage and fewer fungus issues as well as less chance of rain during harvest than in the Sacramento Valley, but this weather also means that more water is required to support the trees. Yearly water use in the southern San Joaquin Valley may be as high as 50-54 inches: in contrast, water use in the southern Sacramento Valley ranges about 41-44 inches a year.³

Rainfall constitutes a portion of the total water supply. Additional water that is applied as irrigation can be calculated by subtracting local average rainfall from the above numbers. In Kern County, 6.1 inches of rain means that 47.9 inches of irrigation is required to produce a crop; in Butte County, 24.8 inches of rain means that only 19.2 inches of irrigation is required.⁴

More than twice as much irrigation water per acre is required in Kern County than is needed to produce the same crop in Butte County.

¹ Public Review Draft, CA Water Plan Update 2009, Volume 2, Chapter 2, page 2-1 Agricultural WUE “describes the use and application of scientific processes to control agricultural water delivery and achieve a beneficial outcome.” Agricultural WUE “includes, 1) an estimation of net water savings resulting from implementation of efficiency measures as expressed by the ratio of output to input; 2) resulting benefits; and 3) strategies to achieve efficiency and benefits.”

² The Governor’s Executive Order S-06-08 directed the Department of Water Resources (DWR) to take immediate actions to facilitate water transfers to respond to emergency shortages across the state. Both California and the US Bureau of Reclamation are financing large production wells (up to 4000 gpm) so that groundwater may be substituted for surface water being sold south of the Delta.

³ Sanden, Blake U.C Drought Management <http://ucmanagedrought.ucdavis.edu/PDF/Sanden%202007.pdf>
Fulton, Alan et al “Irrigation for almond trees with a limited supply” UC Extension Newsletter “Water & Land Resource Manager” Vol. 9 no 1 April 2008.

Comment--Estimates ranged from a high of 57” for full irrigation in “Kern Soil and Water”, Sept. 2007 to a low of 38” in the Sacramento Valley, but it was not clear if ‘total requirement’s or’ total irrigation’ was being described and whether rain or frost protection water was included.--BDH.

⁴ World Climate Source: BAKERSFIELD MEADOWS, KERN COUNTY data derived from National Climatic Data Center Cooperative Stations. 55 complete years between 1938 and 1995.
CHICO EXP. STA. data derived from the Global Historical Climatology Network, 1429 months between 1870 and 1989.

Any transfer of water from north to south also involves transport losses due to evaporation and seepage which occur when water moves along 300 miles of canal. In addition, agencies proposing water transfers through the Delta must calculate for water is loss in outflow to the Bay.

Depending on the season and annual conditions as much as fifty to seventy-five percent (50-75%) of every acre foot flowing into the Delta outflows to the Bay.⁵ This means that to provide sufficient water to support a single (1) acre in Kern County, the supply for four to six (4-6) acres of Butte County almonds must be moved south.

While there can be disagreement about details, nothing can change facts. The Sacramento Valley receives about two feet of rainfall which cannot be easily captured or transferred, but is available for growing local crops. Nor can anyone argue that there are zero losses in transmission through the Delta.

While a case can be made for transferring surplus water, taking areas out of production in the north state to raise less than 25% of the same crop in the San Joaquin makes no economic sense. Spending billions of taxpayer dollars on infrastructure to reduce the net output of California's agricultural economy has even less justification.

Fallowing and groundwater substitution (*included here because of the effect on groundwater dependent agriculture using the same aquifer*) to support surface water sales will likely result in the creation of very large areas of desert in the Sacramento Valley in order to make very small islands of green in the San Joaquin.⁶

DWR's program will be a major factor in promoting (or hindering) agricultural water use efficiency. Fallowing is more efficient when practiced at the end of the pipeline, not the beginning. Contracts with junior water rights holders should be enforced, no matter what they chose to plant. And no one can deny the immorality of a policy that transfers up to six times the economic hit to workers and communities in one region of the state for the benefit of another.

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⁵ DWR Delta Atlas, Delta Flows Components and Comparisons 1995, page 19.

Comment--There are differences in the data about Delta outflow rates; the "Delta Atlas" used an 'average' but in wet or dry years that percentage changes significantly. In "Delta Vision" prepared for the Blue Ribbon Task Force, page 41 shows a range of outflows to the Bay of 87% for 1998-a wet year- to 48% for 2001-a dry year with 69% for 2000-an average year. I chose to use conservative ranges for this discussion. .—BDH

⁶ Barlow, Maude, Senior Advisor on Water to the President of the UN General Assembly, A paraphrase of her statement in the Opening Keynote Speech, Australian Water Summit, April, 2009. 'When you move water from a healthy watershed to a desert, you only create two deserts.'