

### **Use During the Season to Aid Irrigation Operation**

Due to variability of crop growth and weather, a fixed irrigation schedule (such as irrigating every three days once irrigation begins) may not be effective.

A count of microsprinklers or drip emitters per acre is needed, and a reliable estimate of the water emission rate per microsprinkler or dripper is needed, to calculate the weekly hours of irrigation needed.

**For Example:** One microsprinkler is used per almond tree. Each microsprinkler emits nine gallons of water per hour, and the orchard design has 151 trees per acre. So, the average hourly water application rate for this example is 1359 gallons per acre. This equates to a water application rate of 0.05 inches per hour of operation (1.0 acre-inch equals 27,154 gallons—refer to units section). Referring to the weekly water use for almonds (west of river) from April 6 to April 12, 2007 was 0.95 inches.

Additional water is needed to compensate for non-uniform application of water. Field evaluations conducted by the Tehama County Mobile Irrigation Lab suggest 10 to 20 percent more water may be necessary. Table 2 suggests that 1.1 inches of water is needed to replenish the past week of crop water use, if irrigation efficiency is 90 percent. This equates to 22 hours of irrigation, not applied all at once, to replenish the past seven days of crop water use. Rainfall was low (0.14 inches) at the Gerber weather station indicating it was not a significant factor affecting irrigation for the week of April 6 to April 12.

### **Availability of Weekly Soil Moisture Loss Reports**

The reports are available on a weekly basis from several sources from April through October:

#### Newspapers

*Red Bluff Daily News* – Saturdays

*Corning Observer* – Wednesdays

#### Websites

<http://www.nd.water.ca.gov/Data/IrrigationSchedule/IrrigationSchedule.pdf>

[http://cetehama.ucdavis.edu/water\\_\\_Irrigation\\_Program/Weekly\\_Soil\\_Moisture\\_Loss\\_Reports/](http://cetehama.ucdavis.edu/water__Irrigation_Program/Weekly_Soil_Moisture_Loss_Reports/)

Available via a weekly e-mail report on Fridays. Send e-mail request to [aefulton@ucdavis.edu](mailto:aefulton@ucdavis.edu)

### **For Additional Information or Assistance**

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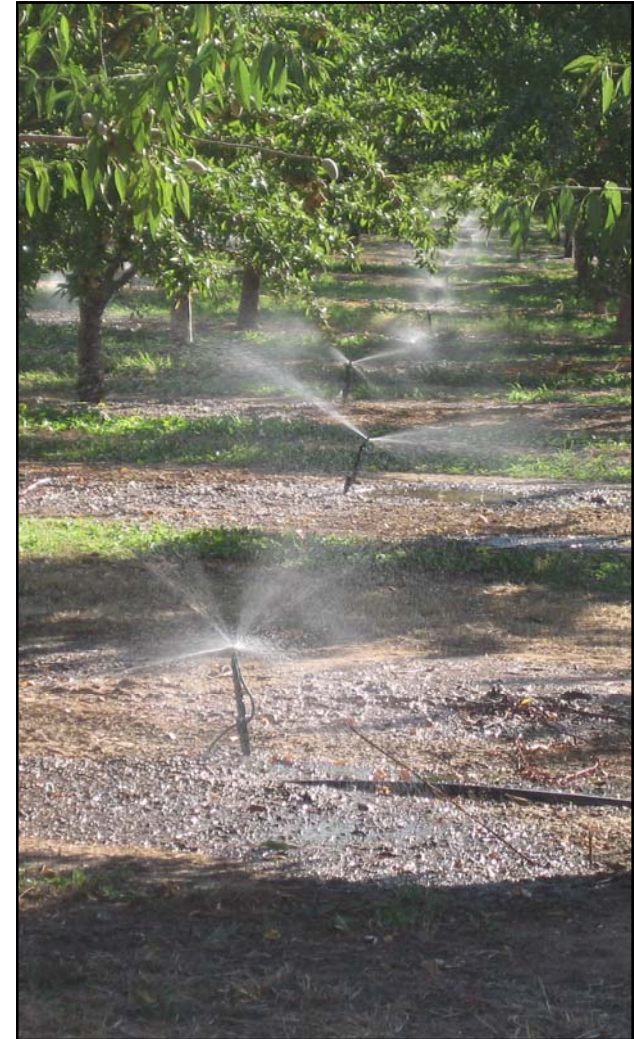
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# Understanding and Using Weekly Soil Moisture Loss Reports



**WEEKLY SOIL MOISTURE LOSS IN INCHES**

(Estimated Evapotranspiration)

04/06/07 through 04/12/07

**West of Sacramento River**

Weekly Water Use	Accumu'd Seasonal Use	CROP (Leafout Date)
1.18	6.41	Pasture
1.13	6.35	Alfalfa
0.89	4.88	Olives
0.77	4.18	Citrus
0.95	4.18	Almonds (3/1) *
0.96	3.14	Prunes (3/15) *
0.64	1.04	Walnuts (4/1) *
1.24	5.29	Urban Turf Grass

**East of Sacramento River**

Weekly Water Use	Accumu'd Seasonal Use
1.19	6.36
1.14	6.31
0.90	4.83
0.77	4.13
0.96	4.16
0.97	3.07
0.64	1.03
1.25	5.24

Accumulations started on February 23, 2007. Criteria for beginning this report are based on the season's last significant rainfall event where the soil moisture profile is at full capacity. \* Estimates are for orchard floor conditions where vegetation is managed by some combination of strip applications of herbicides, frequent mowing or tillage, and by mid and late season water stress. Weekly estimates of soil moisture loss can be as much as 25 percent higher in orchards where cover crops are planted and managed for maximum growth.

<b>0.14</b>	<b>Precipitation (Inches)</b>	<b>0.33</b>
<b>0.68</b>	<b>Accum'd Precip (Inches)</b>	<b>1.04</b>

**WEEKLY APPLIED WATER IN INCHES<sup>1</sup>**

50%	60%	70%	80%	90%	← Efficiency →	50%	60%	70%	80%	90%
1.8	1.5	1.3	1.1	1.0	Olives	1.8	1.5	1.3	1.1	1.0
1.5	1.3	1.1	1.0	0.9	Citrus	1.5	1.3	1.1	1.0	0.9
1.9	1.6	1.4	1.2	1.1	Almonds (3/1)	1.9	1.6	1.4	1.2	1.1
1.9	1.6	1.4	1.2	1.1	Prunes (3/15)	1.9	1.6	1.4	1.2	1.1
1.3	1.1	0.9	0.8	0.7	Walnuts (4/1)	1.3	1.1	0.9	0.8	0.7

<sup>1</sup> The amount of water required by a specific irrigation system to satisfy evapotranspiration. Typical ranges in irrigation system efficiency are: Drip Irrigation 80%-95%; Micro-sprinkler 80%-90%; Sprinkler 70%-85%; and Border-furrow 50%-75%.

For further information, contact the Tehama Co. Farm Advisor's office at 530-527-3101.

**Weekly Soil Moisture Loss Reports** are provided by the Northern District of the California Department of Water Resources and the University of California Cooperative Extension in Red Bluff.

These reports are available on a weekly basis from April through October. Estimates for "West of the Sacramento River" are more representative of Tehama County because they are based on CIMIS data taken near Gerber Avenue and Hwy 99W. The "East of the Sacramento River" estimates are based on CIMIS data from Durham.

**Weekly Soil Moisture Loss in Inches** (First Table)

- estimates soil evaporation and plant consumption for major irrigated crops
- gives crop water use for past seven days and accumulated seasonal use
- is based upon hourly measurements of sunlight, relative humidity, wind, and rainfall
- is intended for healthy crops where soil moisture is not limiting crop growth
- is intended for bearing orchards (typically fifth leaf or older)
- will overestimate irrigation needs for unhealthy trees, young trees, or where water stress may be beneficial
- suggests a maximum amount of irrigation water needed and should be confirmed in the field
- is based on accumulation start dates which change with each irrigation season

**Weekly Applied Water in Inches** (Second Table)

- estimates the amount of water required by various irrigation systems
- provides efficiency ranges for various irrigation systems

**Reporting Units and Useful Conversion Factors**

- actual reporting units in both tables are acre-inches per acre. To simplify, the acre units are canceled out and only inches are reported.
- reporting unit "inches" are the same as commonly used to report rainfall
- soil moisture loss reported in inches can be easily converted to feet (acre-feet per acre) by dividing by 12
- one inch (acre-inch per acre) of water equals 27,154 gallons
- one foot (acre-foot per acre) equals 325,851 gallons

**To Help Decide When to Begin the Irrigation Season**

Refer to the first table and select the crop in question. Compare the "**Accumulated Seasonal Use**" to the "**Accumulated Rainfall**." When the accumulated rainfall begins to drop below the accumulated seasonal use, the shortfall should be provided by irrigation.

**For Example:** Accumulated seasonal use for almonds west of the Sacramento River from March 1 through April 12, 2007 was 4.18 inches. Accumulated rainfall for the same period was 0.68 inches, indicating a soil moisture deficit of 3.50 inches that should be supplied with irrigation. Rainfall measurements taken from your own ranch will improve the accuracy of these projections.