

Weekly Soil Moisture Loss Reports Are Available to Assist Farm Water Management

How to Use the Weekly Water Use Reports

The University of California Cooperative Extension and the California Department of Water Resources have teamed up to provide “**Weekly Soil Moisture Loss Reports**” to agricultural water users. This is the first Weekly Soil Moisture Loss Report for the 2021 irrigation season. Future reports will be distributed on Fridays of each week through the end of October. It includes water use information for a variety of crops. Background information about the reports and ways to use them in on-farm water management are outlined in this article.

Information in each Weekly Soil Moisture Loss Report

ET estimates are for healthy crops where soil moisture is not limiting growth. Estimates are for bearing orchards (typically fifth leaf or older) that are approaching full canopy. Estimates in these reports suggest a maximum amount of irrigation water used by the crop based on local weather stations. Some growers may consider applying less than full ET (wine grapes, almonds) to achieve quality and disease management goals. Rainfall received during the growing season and stored soil moisture from the dormant season contribute to meeting these estimates and will reduce the irrigation water needed. Irrigation decisions based on this information should be confirmed with field monitoring. Irrigation systems that apply water with a high uniformity require less water to supply the crop needs.

Use in the Spring Season to Help Decide When to Begin the Irrigation Season

The assumption for these reports is that winter rains were sufficient to effectively refill the soil profile and we are starting the season at full field capacity. Rains that occur during the season proportionately reduce the need for irrigation water. Trees and vines do not use water when there are no leaves so the irrigation “season” begins when the first leaves appear in local orchards. Referring to the first table, select the crop in question and compare the “*Accumulated Seasonal Water Use*” since leaf-out to the “*Accumulated Rainfall*”. As the seasonal crop water use exceeds accumulated rainfall, compare the difference to the water holding capacity of the soil in the crop root zone. The choice is to rely on soil storage to supply the difference or to begin to irrigate.

Use throughout the Season to Aid Irrigation Operation

Crops go through phases of growth and the weather can be highly variable during the season. These weekly reports can be used to help adjust for changing growth phases and weather conditions. In order to apply this information, the water application rate from the irrigation system must be known. For orchards and vineyards, this can be estimated with a count of micro sprinklers or drip emitters per acre along with a reliable estimate of the water emission rate per micro sprinkler or dripper.

Almond Orchard Example: One micro sprinkler is used per almond tree; each micro sprinkler emits nine gallons of water per hour; and the orchard design has 151 trees per acre. The **hourly** water application rate for this example is 1359 gallons per acre. This equates to a water application rate of 0.05 inches per acre per hour of operation. The math is as follows: 1) 151 micro sprinklers per acre multiplied by 9 gallons per hour emission rate equals 1359 gallons per acre per hour; and 2) 1359 gallons per acre per hour divided by 27,154 equals 0.05 inches per acre per hour of operation (there are 27,154 gallons of water per acre-inch).

Suppose an upcoming weekly report shows that almonds used 1.80 inches of water per acre and they are irrigated with the micro sprinkler system described above. At an hourly water application rate of 0.05 inches per acre per hour of operation, a maximum of 36 hours of operation would be needed during the week to match the estimated soil moisture loss. The weekly hours of operation may be reduced further if rainfall occurs or if a reasonable contribution from soil storage is allowed. Depending on your soil water holding capacity, growers may decide to split those 36 hours into two sets of 18 hours each or even three sets of 12 hours each.

Additional water is needed to compensate for non-uniform application of water. Table 2 in the Weekly ET Report helps determine how much water is needed based upon your systems irrigation efficiency keeping in mind that less efficient irrigation systems apply water less uniformly. Typical ranges in irrigation system efficiency are: Drip, 80%-95%; Micro-sprinkler, 80%-90%; Sprinkler, 70%-85%; and Flood, 50%- 75%.

If you or someone you know would like to receive these weekly ET reports, please send an email to Sandi Gudino at slgudino@ucanr.edu or call the UC Cooperative Extension office in Stanislaus County at 209-525-6800.

Best wishes,

Roger Duncan and Kari Arnold, UCCE tree crops advisors in Stanislaus County