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

(To be included in first publication next to "Weekly Soil Moisture Report")

The Northern Region of the California Department of Water Resources and the University of California Cooperative Extension in Tehama and Glenn counties 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 20l6 irrigation season. 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

Estimates labeled "*Tehama County – Gerber South*" are based on weather measurements from CIMIS station #222; those labeled **"***Butte County - Durham*" are taken from CIMIS station #012; and estimates labeled **"***Colusa County - Colusa*" are taken from CIMIS station #032. They are for healthy crops where soil moisture is not limiting growth. Estimates are for bearing orchards (typically fifth leaf or older). The following weeks estimated crop ET (ETc) are also provided. Estimates suggest a maximum amount of irrigation water needed. Rainfall received during the growing season and stored soil moisture from the dormant season contributes 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

December and January rainfall was substantial and has effectively refilled part or all of the soil profile. February rainfall has fallen short of expectations but earlier rains have supplied sufficient soil moisture storage to provide a good beginning point for using these Soil Moisture Loss Reports. On-site assessment of the soil moisture storage beginning in early February is still suggested to consider site specific conditions when applying information from these reports. 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.

An Example: Accumulated seasonal water use for almonds from February 15 through February 25, 2016 was 0.47 inches while accumulated rainfall from the Gerber South weather station in Tehama County was 0.28 inches. Rainfall measurements taken from your own farm or ranch will improve the accuracy of this projection. In the case of almonds, which are the earliest orchard crop to leafout and begin developing a full canopy, a 0.19 inch soil moisture deficit had developed through February 25. When the deficit accrues to an amount greater than will be applied with a single irrigation event, it may be time to begin irrigating.

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, 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. Another option is to contact the Tehama County Mobile Irrigation Lab listed below and arrange an irrigation system evaluation. In the past, this service has been available at no cost but a fee may be required in 2016.

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 from May 6 to May 12, 2016 use 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.

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 15 percent more water may be necessary. 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.

Have Questions or Looking for More Assistance?

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