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 Red Bluff 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 20l3 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 "*West of the Sacramento River*" are based on weather measurements taken near Gerber. Estimates labeled **"***East of the Sacramento River*" are based on measurements taken near Durham. They are for healthy crops, where soil moisture is not limiting crop growth. Estimates are for bearing orchards (typically fifth leaf or older). Estimates suggest a maximum amount of irrigation water needed. Rainfall received during the growing season and stored soil moisture from the dormant season also 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. This season, we are continuing to provide NOAA *forecasted* week of water use as additional information.

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

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 water use exceeds accumulated rainfall, compare this difference to the water holding capacity of the soil in the crop root zone.

An Example: Accumulated seasonal water use for almonds from March 1 through March 14, 2013 was 0.69 inches while accumulated rainfall from the Gerber station on the Westside of the river since March 1 was 0.30 inches. In the case of almonds, which are the earliest orchard crop to leafout and begin developing a full canopy, a 0.39 inch soil moisture deficit has developed through March 14. When the deficit accrues to an amount greater than will be applied with a single irrigation event, it may be time to begin irrigating. By referring to these weekly soil moisture loss reports, the effects of changing weather conditions can be considered and the soil moisture depletion can be estimated to help decide when to begin irrigating and how much water to apply. Rainfall measurements taken from your own farm or ranch will improve the accuracy of this projection.

"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 crop 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 and the water application rate will be determined for you. In the past, this service has been available at no cost but a fee may be required in 2013.

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, a common volumetric unit of measure used in irrigated agriculture).

Suppose an upcoming weekly report shows that almonds (west of river) from May 4 to May 10, 2013 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 hours of operation may be reduced further if rainfall occurred during the week 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 20 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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