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Adjusting soil water balance calculations for light rainfall, dew, and fog.

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The main sources of water for an irrigated crop include irrigation applications, precipitation, water tables, fog interception, and dew formation. For a well-drained soil in a climate where there are a few events of fog, dew, or light rainfall, computing a water balance is relatively easy, but it is complicated in regions characterized by considerable events of fog, dew and light rainfall. In these regions, growers are hesitant to use ET-Based scheduling because the cumulative crop evapotranspiration is often considerably higher than the soil water depletion. We will present a simple and practical procedure to estimate the contribution of fog interception, dew, and light rainfall to daily crop evapotranspiration in California and to show how to use the information to improve water balance calculations for efficient water use in irrigation. It is assumed that the relationship between normalized hourly ETo and time of the day is similar to the relationship between normalized hourly ETc and time of the day. We can describe the change in soil water depletion (ΔDSW) on that day as: ΔDsw =ETc x F where F is the fraction of ETc coming from the soil, and F is determined using the expression:

$$F = \frac{1}{1 + e^{\left(\frac{t-12.5}{1.65}\right)}}$$

Where t is the approximate local standard time in hours when the crop dries. This simple method improves water balance scheduling and the adoption of the ET-based scheduling method in microclimates where fog, dew, and light rainfall are common.