

ET Phone Home, Smart Controllers®

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INTRODUCTION

I installed my first irrigation system in 1976 and have been learning more about the industry ever since. I am here to share my experience with smart controllers and when and how to use them.

What is SWAT? It refers to “smart water application technologies” which encompasses a national initiative with water purveyors and industry representatives that promote new technology and increased efficiency. This includes controllers, sprinkler heads, nozzles, pressure reducers, as well as, non-irrigation-related items.

There are two types of smart (dynamic) controllers; evapotranspiration (ET) based controllers and soil moisture sensors. What is ET? Evapotranspiration stands for the total amount of water transferred from the earth and plants to the atmosphere as a result of local weather.

To understand smart controllers one must understand ET. Evapotranspiration is measured in inches per day and is controlled by humidity, solar radiation, temperature, and wind speed. Smart water management means applying the right amount of water at the right time based on the data collected by a smart controller. For instance, if the day is warm but partly cloudy, it will adjust the amount of irrigation applied. If the following day is very sunny and hot with no clouds, the smart controller may determine that two irrigation events may be needed to replenish the water lost through ET. A third day may be rainy or cloudy all day and no irrigation is applied.

Evapotranspiration smart controllers are weather based, they use local weather and local site conditions. Weather data may be current, daily, or historical. Some units have more data inputs than others. In general the more information you can program into the controller the better the irrigation schedule will be. Some units only work on the existing schedule in the controller and are turned off or on, when a pre-determined threshold is met. Developing a water schedule may use a depletion model based on ET or a simulated ET. The operator inputs the parameters such as soil, sun, sprinkler, or inputs a schedule. The controller then calculates the ET and makes changes to an existing schedule, develops a new schedule, or terminates a schedule.

A soil moisture controller measures the amount of water availability in the soil. Measurements may be made in more than one area on a site. The controller waits for the water in the soil to be depleted then water is applied. This is known as the depletion model. A soil moisture controller is site specific and cannot use ET data that may be available in a particular geographic region.

A dumb (static) controller is based on regimented time frame like 15 min per day. The advantage of using smart controllers instead of time-based controllers is water savings. However, smart controllers are not a panacea. They cannot make an inefficient system efficient. Human interaction is still needed to make necessary adjustments.

There are simple and more complex controllers, but all save water. New systems have the most potential for savings water and increasing profits.