# Scheduling irrigation using an evaporation pan

An evaporation pan is one relatively simple method of obtaining reliable and consistent information on evaporation that can be used to aid grower irrigation scheduling decisions.

Plants draw water from the soil or growing media and lose or transpire the vast majority of that water to the atmosphere through their leaves. Evapotranspiration (ET) is the transfer of water from the landscape to the atmosphere, combining plant transpiration and soil/growing media water loss, but is somewhat difficult to measure. Pan evaporation can be location specific and presents relatively easy access to extremely useful information. The amount of water lost to the atmosphere from a plant depends on the evaporative demand of the air. Measurement of the evaporation from an evaporation pan provides data used in calculating the level of irrigation required to recharge the soil or growing media with water lost during the previous 24 hours. An evaporation pan can be located on site to provide a true and accurate measure of evaporation for that particular location. Measurements to obtain the data from an evaporation pan take less than five minutes per day and provide very specific information for that location.

It is commonly understood that evaporation is greatest on hot, dry, windy days and much lower when the weather is cool, still and humid. The challenge is to measure this evaporation and provide a link or relationship to plant irrigation requirements. Pan evaporation is a measurement of the temperature, humidity, solar radiation and wind. An evaporation pan is a tangible thing that is used to hold water, afford visible confirmation, and provide evaporation data for a given location. There are a variety of evaporation pans in use throughout the world with many countries including Australia standardising on the 'Class A evaporation pan' and very specific installation practices to provide reliable and comparable results.

A 'Class A evaporation pan' has specific construction and location parameters:

- a cylinder with a diameter of 120.7cm and depth of 25.4cm
- made from 20 gauge galvanised iron (other materials have different thermal and reflective properties providing inconsistent and incomparable results)
- filled with water to within 6cm of the pan top
- supported on a level wooden base 150mm above the ground
- located on a mown grassed area, free of tall weeds, bushes and trees
- sited to prevent any shading
- covered with wire to prevent birds and animals from gaining access.

The materials, dimensions and location are vitally important to provide evaporation results and proposed irrigation volumes that can be compared. eg. the effect of wind and temperature on evaporation will vary with changing water depth or surface area.The evaporation data from the 'Class A evaporation pan' is normally measured daily at 9.00am to obtain details of the evaporation from previous 24 hours. It is important that the readings and refilling of the pan occur regularly at this time or the pan holding less water will heat up more quickly and cool down faster, providing false readings.

Calculations are based on the depth of water in the pan. Evaporation will cause the water level to fall and measuring this fall or loss from the pan will provide the evaporation data for the previous 24 hour period. A measured volume of water is added to the pan using a graduated measuring cylinder to refill the pan to normal, a level 6cm from top of the pan. The amount of water added is the evaporation. Calculating this

evaporation into a figure that can be used and compared is relatively simple calculating every 1.14 litres of water added to the pan equalling  1mm of evaporation. Automated Class A evaporation pans are available.

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