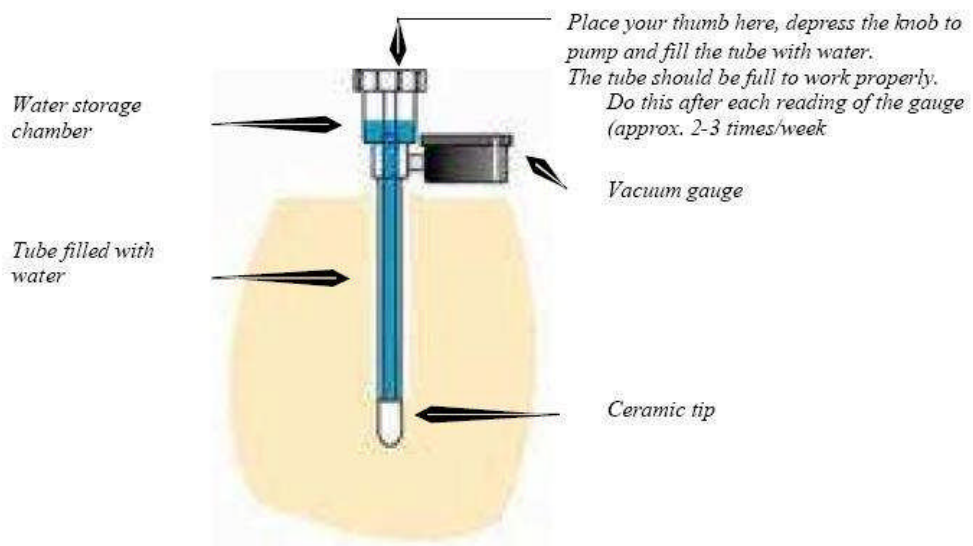


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Irrigation Management using Tensiometers

What is a Tensiometer?

A tensiometer is a soil moisture measurement tool that can assist growers with irrigation scheduling. It consists of a sealed tube filled with water, a porous ceramic tip and a vacuum gauge.



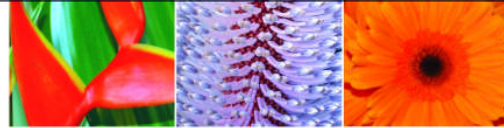
Installation:

1. Fill the tube with water and soak the ceramic tip in water the day before installation.
2. Make a hole at the site selected for the tensiometer to the width of the tensiometer tube. This is achieved by either driving a hole with a pipe or using an auger.
3. Correct depth of the hole is essential - the ceramic tip must be at the depth of soil that is to be monitored. Make up a slurry of dirt (screened to remove lumps, organic matter and stones) and water.
4. Pour slurry into the hole and immediately insert the tensiometer to the desired depth of the hole. If it is a tight fit there may be no need for the slurry but the ceramic tip must have good soil contact to work properly.

How many do I need and what size tensiometer should I buy?

Tensiometers come in a wide range of sizes - length of tube. You will need to know the effective rooting zone for your crop. Buy the tensiometer that fits into your rooting zone you wish to monitor. Two tensiometers at different depths are often used in irrigation scheduling. One tensiometer is located at the middle of the effective rooting depth to indicate when to turn on the irrigation and another just below the root zone to indicate when the water has passed the root zone and hence when to turn off the irrigation.





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How does it work and what do the reading mean?

As the soil dries out, water is sucked out of the tensiometer through the porous ceramic tip. This creates a partial vacuum in the tube, which registers as an increase on the vacuum gauge. Conversely, if irrigation or rainfall occurs and the soil becomes wet, water is sucked into the tube, the vacuum is reduced and the reading on the gauge decreases.

Readings should be taken 2-3 times per week during summer and usually at the same time of the day for each of the readings, where possible. The following table should act as a guide only – you will need to closely monitor crop growth in relationship with the readings in order to fine tune the setting that best suits your soil and crop type.

Reading	Soil Condition	Irrigate	Notes
0	Saturation	No	Zero readings can be expected after heavy rain
0 -10	Surplus water	No	Water held by the soil in this range drains off within a few days.
10-20	Field Capacity	Maybe	Best conditions for soil moisture and crop growth. Irrigation may need to be started in coarse sandy soils with water sensitive plants.
20-40	Available moisture for plant growth.	Yes	Irrigation started for coarser sands in the 20-30 range and for finer sandy soils in the 30-40 range.
50-80	Dry to very dry	Yes	Yields will be affected.



Tensiometer installed in a Protea crop



Queensland Government
 Natural Resources and Water



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