

IrriGate

Sustainable Irrigation Services - North East, Mid and Upper Goulburn Broken Dryland

Welcome to IrriGate Issue 6.

I would like to take this opportunity to say farewell, I will be relocating to DPI Wangaratta to take up a new position. I have enjoyed my time with irrigation immensely, meeting and getting to know you all, originally with Water for Growth and Project Leader John Nieuwenhuis and in recent times with Water Smart Farms and Project Leader Dennis Watson. Best Wishes. Wendy Paglia - Editor

North East Dryland Catchment



Goulburn Broken Dryland Catchment (excluding the Shepparton Irrigation Region).



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Tracking water requirement over the season

What an unusual irrigation season this one has been. The majority of irrigators across the region only irrigated 2 to 3 times over the season; some not at all. Figure 1 shows an example of a theoretical water budget for lucerne grown in the Myrtleford area over the 2010/2011 irrigation season. The blue line indicates a water filled soil profile, while below the red line indicates plant stress. In this case only two irrigation events occurred, 15 mm applied on the 5 January and 25 mm applied on the 28 January indicated on the graph by the light blue triangles. This with the addition of rainfall was enough to just about keep the water balance out of a negative state, until the start of March. Another irrigation at this point in hind sight could have been useful. However given the rainfall events prior, at the time it made sense not to irrigate and exacerbate potential water logging issues as winter approaches.

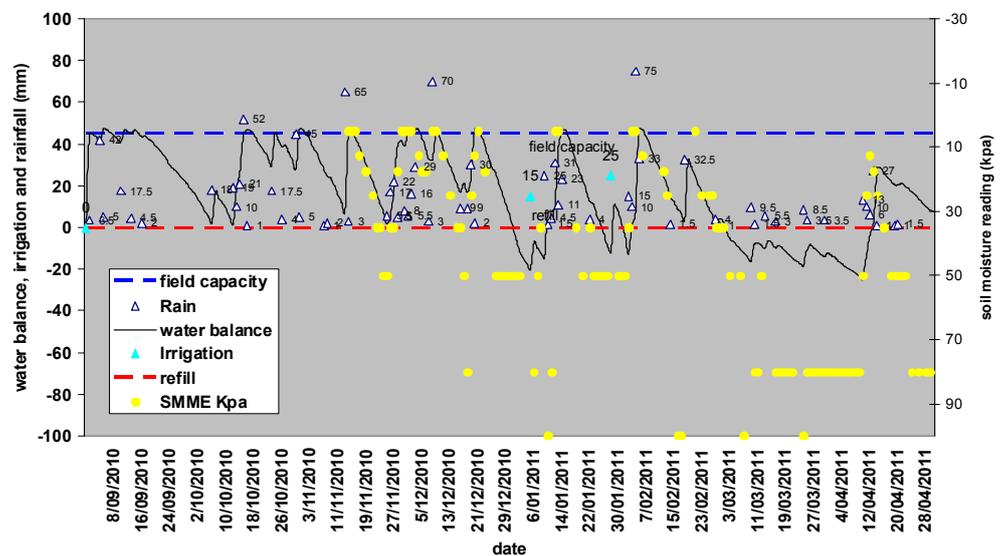


Figure 1: Water balance of lucerne over the 2010-2011 irrigation season

The yellow dots on the graph are soil moisture readings shown in Kpa using the scale on the right hand side of the graph. These were recorded from a "G-dot" installed at 30 cm. The soil moisture readings correlate pretty well with the theoretical water balance.

i.e. when the theoretical water balance is indicating the soil moisture is adequate the probe is saying the same thing, and when the water balance is getting dry the probe reflects this.

Monitoring the plant's moisture not the soils



Figure 2: Pump-Up Pressure

A number of irrigators are striving to improve water use efficiency by measuring the level of moisture stored in the soil to determine if irrigation should occur and how much water should be applied. There is a myriad of equipment out there that can help do this. There is however other equipment which can measure moisture stress directly from the plant. There are a couple of benefits of doing this.

- The reading is a direct measure of how the plants are feeling, not an assumption based on soil moisture levels.
- The other benefit is determining if there are plant health problems. For instance the soil moisture may be adequate but there may be root constraints such as root-rot problems, or soil compaction, soil acidity, or the root system may be reduced due to poor past irrigation practice to name a few.

One such piece of equipment is the "Pump-Up Pressure Chamber" (Figure 2). This works by placing a leaf in a chamber and applying pressure until moisture droplets starts to appear (viewed through a microscope) on the cut leaf stem (Figure 3). The higher the pressure required to produce the droplets the higher the moisture stress of the plants.

This can be a little bit awkward and time consuming to use in the field on a daily basis but can provide some very useful information at strategic times throughout the irrigation season. The "Pump-Up Pressure Chamber" is more commonly used in horticulture than the fodder industry.

This units sell for approximately \$1,500, but remember you may be eligible for a 50% rebate.

More information can be found on the following website. www.pmsinstrument.com

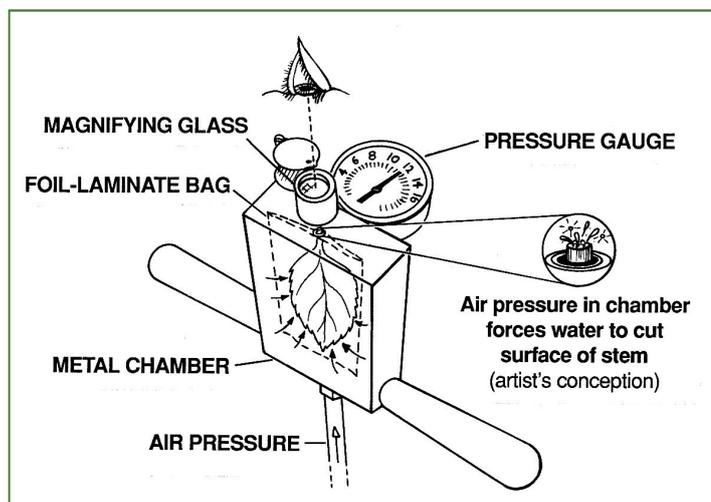


Figure 3: Diagram a leaf in the Pump-Up Pressure Chamber

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