Wisley's Alpine Log

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I was recently showing some of our trainees the conductivity meter that we use for measuring the strength of fertiliser solutions, and I thought it would be worth sharing about this here as a change from our usual topics. Here is what one example of a conductivity meter looks like:

So what exactly does this tool do and why might you find one useful?

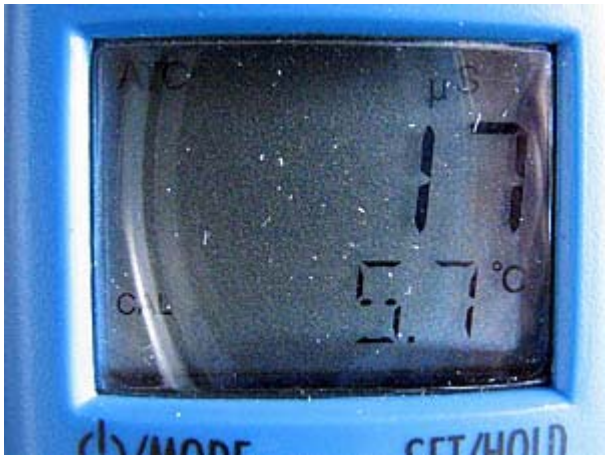
What it does is to measure how much electrical current can pass through a solution. This gives a measure as to the quantity of chemicals dissolved in the water. This measure is sometimes expressed as TDS which stands for "Total Dissolved Solids" and the readout is given as "parts per million" (ppm). An alternative measure is a direct reading of the electrical conductivity and is expressed in units called micro-siemens which is written as µs. I prefer to use the µs reading myself.

Why might you find one useful?

For many gardeners such a device may be an unnecessary expense (around £40.00 for the one shown), but for some things it can be invaluable. Professional growers often talk about water quality as an important aspect of providing optimal conditions for plant growth. Why is this? The best way to show the answer to that question is to show you the results we got when we used

the meter to measure two water samples. The meter is very simple to use – you just remove the cap, switch the device on and dip it into the sample:

In the cup is tap water straight out of our taps. Notice the reading of 630 µs.



Next we measured a sample of rainwater out of our storage tank, which collects rainwater from the roof of our large polytunnel. This gave a reading of just 17 µs.

Tap water in our part of the world is very “hard” which means it has a lot of calcium carbonate (chalk) dissolved in it. This is what is giving us the high reading of 630 µs

Now imagine your passion is orchids. Many orchids are very sensitive to fertiliser levels. For example, if you grow Disas it is known that they like fertiliser levels of around 150 µs in strength. Our tap water is already at 630 µs before we add any fertiliser!!! So it is imperative to have rain water for these (or water purified by processes such as reverse osmosis). By starting with rain water at just 17 µs we can safely add some fertiliser, and using the meter we can make sure we add only enough to make it around 150 µs in strength. Without a meter we would have no way of knowing how strong our solution was. I use this meter a lot both at home and at work. For example, my *Pleione* like more fertiliser than Disas and enjoy around 800 µs. So I use the meter every week in the growing season to make up fertiliser of just the right strength.

Disas (above) like fertiliser solutions to be around the 150 µs mark

Pleione, like this P. Ueli Wackernagel (below), like stronger feed, around 800 µs

By the way, for comparison, made up at the full strength as on the packet, many everyday fertilisers would come out with a reading in the range of 1000 µs to 2500 µs.

The meter is useful in other ways too. For example, you come across a watering can with liquid in and you don't know if it is rain water, tap water, or left over fertiliser solution. The meter will soon tell you.

Because conductivity varies with temperature you will note in the photos that the meter also gives you the temperature of your sample. This meter compensates automatically for this. One other thing to note is that some things – particularly organic compounds – don't affect conductivity when they dissolve in water, so a conductivity meter will not measure these. This can be important for fertiliser use because in cheap fertilisers, often the main source of Nitrogen is from Urea, and Urea does not affect conductivity and so is not measured by meters. This must be born in mind if you are using such a fertiliser with sensitive plants.

Well as this is the last log for 2009 may I take this opportunity to thank you all for your support and wish you the very best for the festive season.