



Wine Islands Growers Association
18th April 2007



Who is ESI ?



“Since 1994, industrial technology company specializing in the development and commercialization of soil moisture monitoring solutions”

For the last twelve years ESI have specialized in the development and manufacture of soil moisture monitoring and control solutions – our Moisture Point instrument is used in numerous research institutions around the world

And the Gro-Point™ sensor that we are focusing on here tonight is considered to be the Cadillac of sensors – the most reliable and trusted sensor in its class. As you’ll see, in addition to building sensors we also offer a full range of data collection options and irrigation control systems allowing growers to completely control their irrigation based on their soil moisture data.



Market Sectors Agriculture



High Value Crops Include:

- ◆ Grapes
- ◆ Avocados
- ◆ Tree Fruits
- ◆ Citrus
- ◆ Cranberries
- ◆ Peppers



“60 percent of U.S. water intended for crop irrigation never reaches the crops”

Source:

Although we work in a wide range of sectors, from roads to soccer pitches, I'd like to focus tonight on the agriculture sector – as you can see, we work primarily in the high value crop sector, with crops such as grapes and citrus fruits. This is a sector that is facing increasing pressures to both increase their yields and use scarce water resources more efficiently



Who Are Our Clients ?

- ◆ Champagne Institute, France
- ◆ University of California-Davis
- ◆ AAFC-Summerland, BC

Several thousand sensors across the US

- ◆ Lang Vineyards
- ◆ Victorian Epicure
- ◆ R and R Management



We have a wide range of clients in the wine industry – we are used in the world’s leading research institutes, such as the Champagne Institute, UC Davis and, closer to home, Agriculture and Agrifood Canada in Summerlands. On a practical front, we have sold sensors to several thousand clients around the world, with many hundreds of sensors sold in California into wine growers in that market.

Closer to home, we have spent the last six months talking to our local growers and names such as Lang Vineyards have already come on board with many more sales imminent



Why Monitor Moisture ?

Accurate knowledge of soil moisture allows you to:

- ◆ Increase crop yield
- ◆ Increase crop quality
- ◆ Decrease water and energy costs
- ◆ Decrease fertilizer use
- ◆ Reduce leaching and erosion



So – why do we want to monitor moisture ? At a high level, you are looking to increase both your yield and the quality of your crop – if you are paying for your water and pumping costs you'd like to reduce those expenses as well as cut down on any soil amendments and fertilizers that you may be using – last, but not least, you want to reduce leaching and soil erosion – all good things but a grower of ours in California phrased it more succinctly....



Why Monitor Moisture ?

**Water is 80% of growing
healthy plants**

Water is 80% of growing healthy plants and...

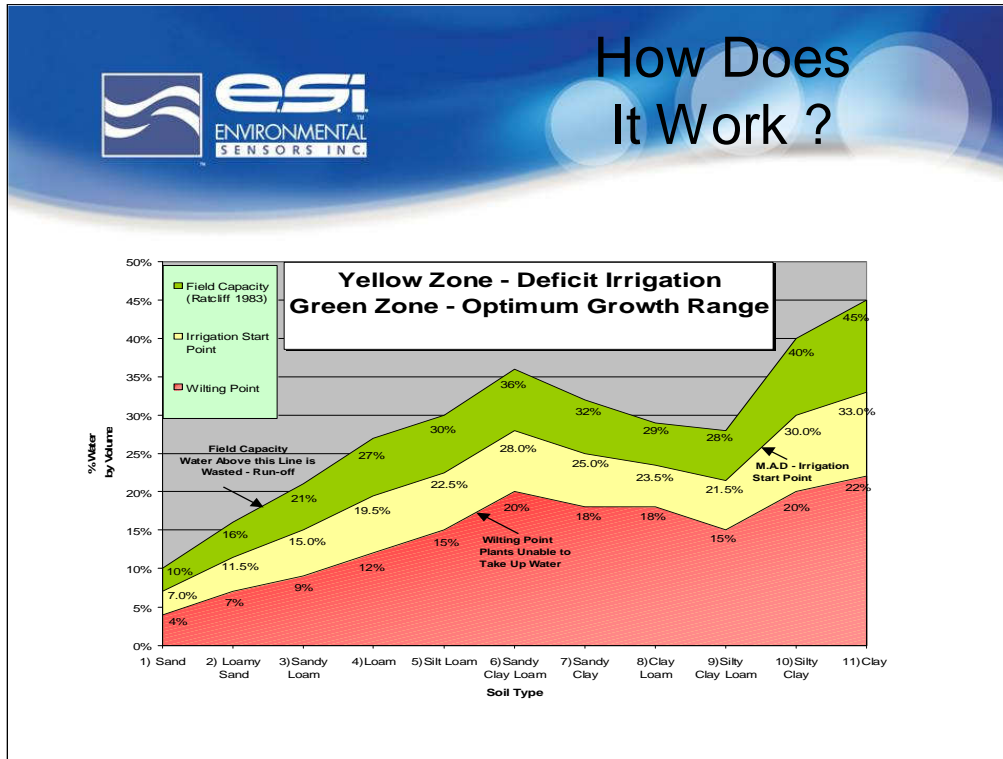


Why Monitor Moisture ?

Healthy Plants Make Healthy Crops

Healthy plants make healthy crops – it makes plants that are more resistant to disease and fruit that meets the market standards that you are aiming for

How Does It Work ?

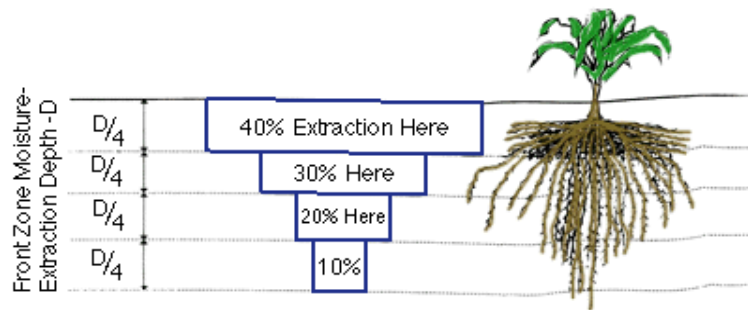


So – how does it work ? I’m going to start at a basic principle that you may be very familiar with – soil has two key thresholds – field capacity is how much moisture your soil can hold – exceeding field capacity leads to run off and waste as the soil can’t retain the water that you’re pumping into it – bad for you, bad for your soil and bad for your crop. At the other end of the scale is the permanent wilting point – the level at which your plants are not able to extract moisture from the soil and, therefore, begin to die. As you can see, sandy soils have a low wilting point – it’s easy for the plants to pull water out of these soils – for clay type soils we have a higher wilting point as it is harder for the plants to pull the water from these soils.

The optimum irrigation level is a balance between these two points.

Where Do I need The Water ?

For grapes 90% of the roots are in the top three feet

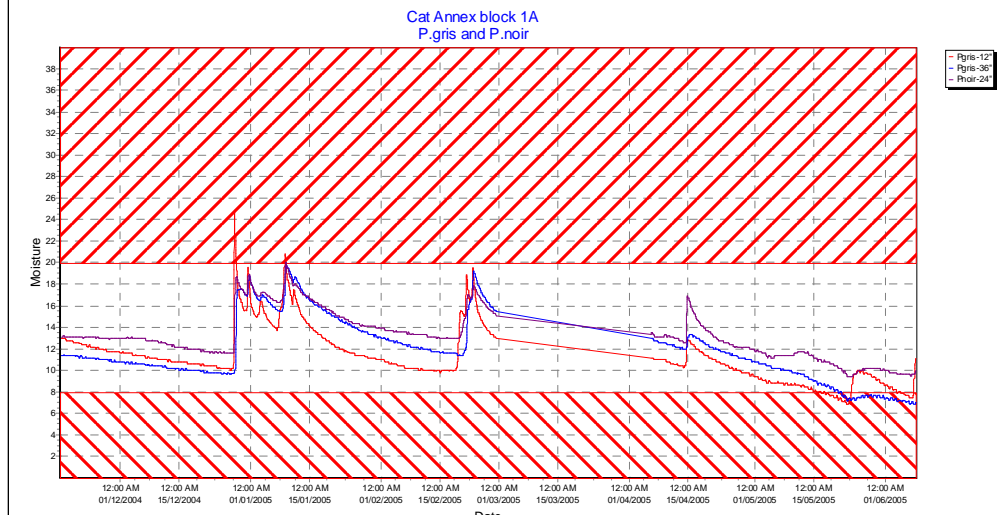


You also need to understand your plants and where you need to irrigate – for example, some plants have a lower wilting point because they are better at pulling water from the soil. Irrigation is, therefore, 50% art and 50% science – we can tell you how much moisture is in your soil but only you can tell whether the plant is reacting properly at the level of moisture – we are giving you data to help you understand what your experience is telling you is occurring.

In grapes, 90% of your roots are in the top three feet of soil and it is here that you need to focus your attention – growers will typically place one sensor in the root zone and one underneath to record the wetting front.



What Does It Tell Me ?



So – here’s a graph showing the output from our sensors and the moisture levels – what is it actually telling us? First, please note the red shaded areas – these represent the field capacity and wilting point – this graph has been set up for a sandy loam soil with a field capacity at 20% volumetric moisture content and 8% permanent wilting point.

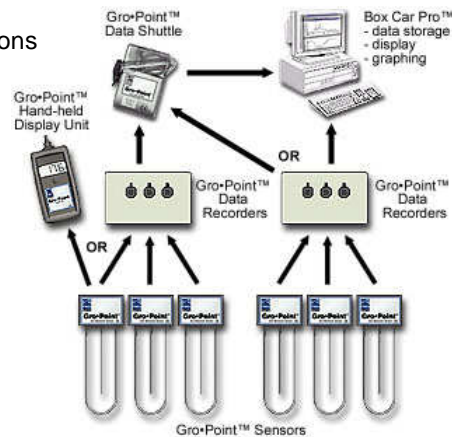
At this point, you can see a spike – that’s over irrigation – the water goes in and runs straight off. Later on, we have three spikes but these fall within the irrigation zone, so they are normal events – but then we look to the right here and we see that the blue sensor has dropped below the wilting point and flat lined – this means that the plants have stopped being able to pull moisture out of the soil as the moisture is no longer declining. This is somewhere you really don’t want to go and, if you look at the red line you’ll see a sharp jump in moisture as the grower started to irrigate again.

The ideal is to maintain yourself in the middle zone – a grower that I know in California typically runs 6 cycles of this type then deliberately creates a spike of over-irrigation to flush out his soils

Only a soil moisture sensor will give you this information – there is no other instrument available that will tell you what is happening in the roots of your crop

Intelligent Irrigation Management Solutions

- ◆ Scalable Solution
 - ◆ Stand Alone to Multiple Sensor Inputs
- ◆ Centralized PC
- ◆ Flexible Configuration
- ◆ Irrigation Management



What are your options ? Here's the basic Gro-Point™ sensor – retails at CDN\$215 – you can read a sensor with a handheld display unit – This comes in at \$400 but you only need one of these to read all of your sensors. In order to get historical data, you need a datalogger – the standard four sensor datalogger retails at \$515 so, for around a thousand dollars, you can set up an initial monitoring location providing you with the data that you've seen on the graphs. Our sensors also hook up to a wide range of weather stations and dataloggers currently available in the market.

Above that we can scale up to our radio based monitoring solutions or control systems.



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