

BIGG soil moisture monitoring workshop 2014

Soil moisture monitoring in vineyards

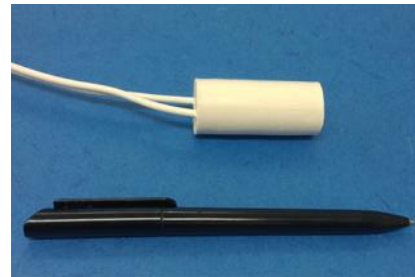
Adam Pietsch
Viticulture Advisor





Common methods of soil moisture monitoring in Barossa vineyards

- Vines
- Shovel/digstick
- Gypsum blocks
- Neutron probe
- Intermittent capacitance probe
 - E.g. **Sentek Diviner**
- Continuous capacitance probe
 - E.g. **EnviroPro**, Sentek Enviroscan





What information can we get from soil moisture monitoring

- How 'full' is the profile? And how much moisture is in reserve?
- Where is moisture being used from?
- How fast is moisture being used?
- Where are irrigations going?



Goals of soil moisture monitoring in Barossa vineyards

A tool to assist in **irrigation decision making** for the management of:

- Quality
- Production/yield/vigour
- Heatwaves
- Salinity?

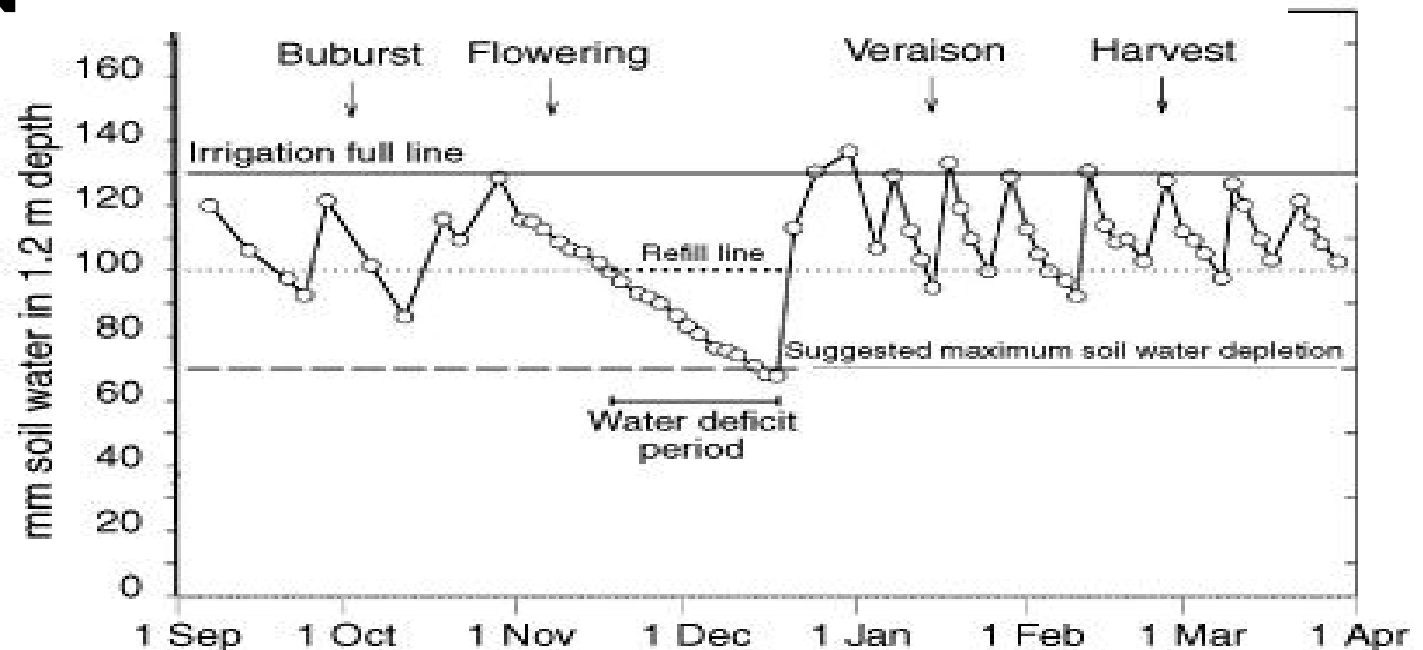
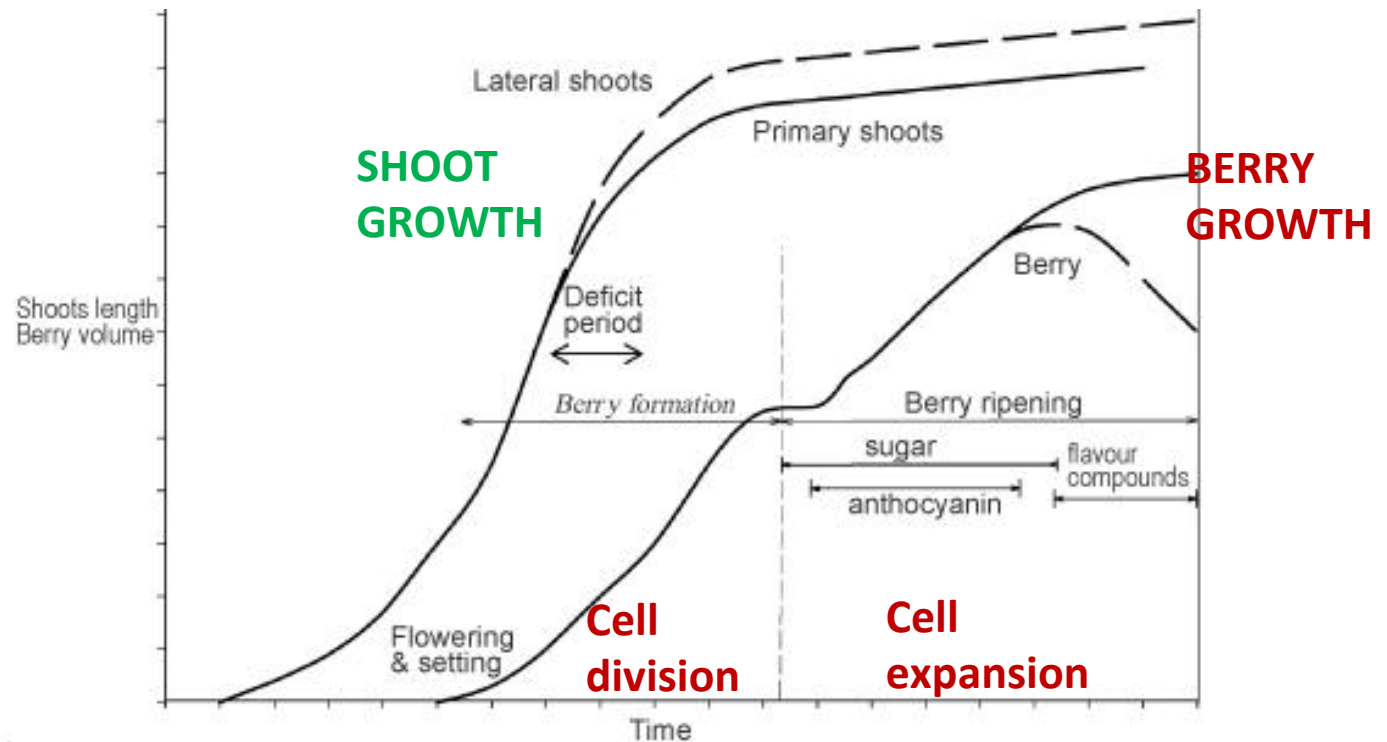
With limited/expensive water supplies



Irrigation strategy: REGULATED DEFICIT IRRIGATION

The theory
behind quality
improvement

Regulated deficit irrigation and partial
rootzone drying as irrigation
management techniques for grapevines
M.G. McCarthy, B.R. Loveys, P.R. Dry
and M. Stoll
[http://www.fao.org/docrep/004/
y3655e/y3655e11.htm](http://www.fao.org/docrep/004/y3655e/y3655e11.htm)



SENTEK DIVINER 2000



- Portable probe & logger
- Access tube in the vineyard
- Readings taken every 10cm by 'swiping' the probe down & up the access tube
- Max. depth 160cm





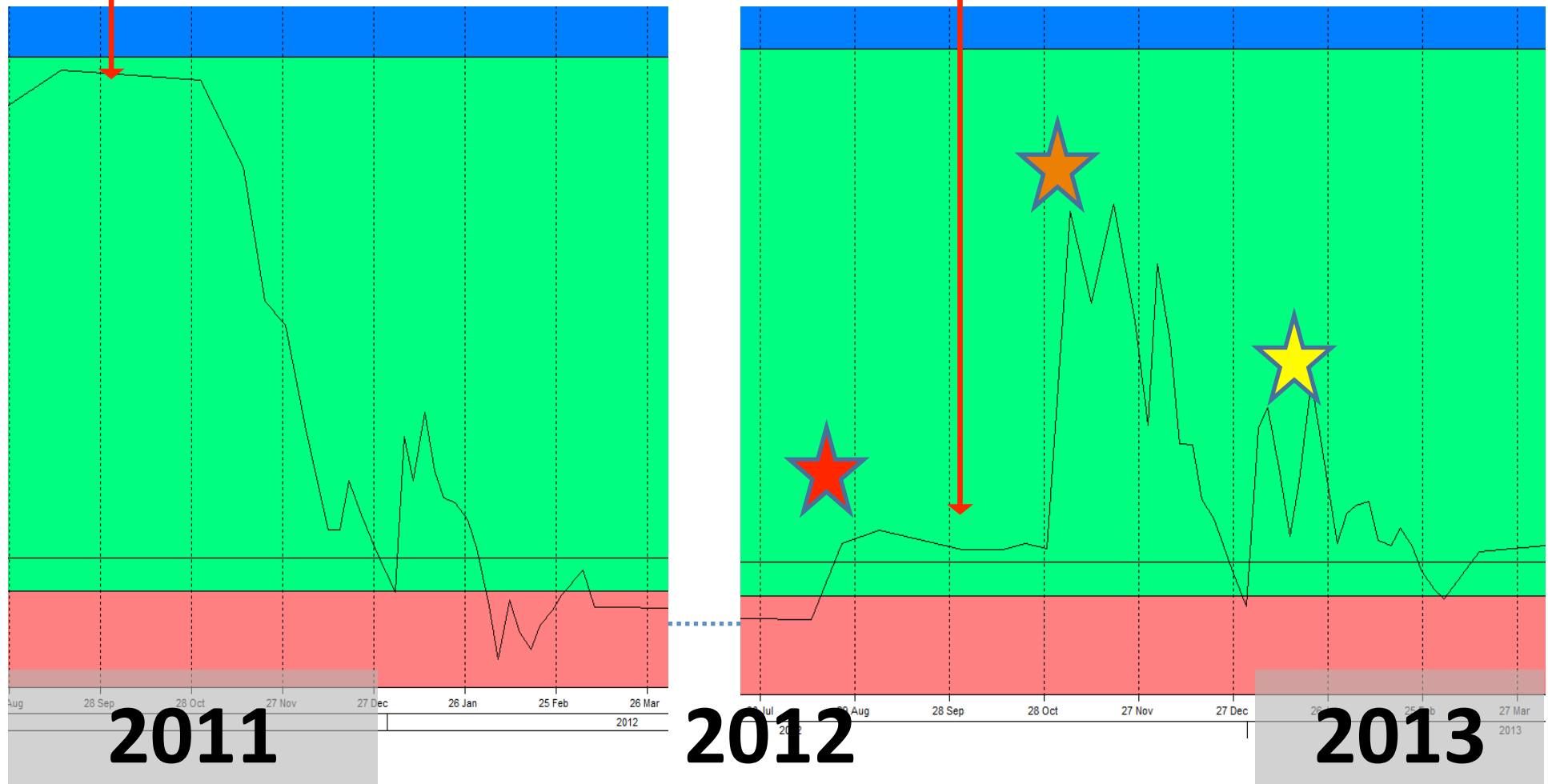


SENTEK DIVINER 2000

Example 2

Total moisture from the
10 to 100cm readings

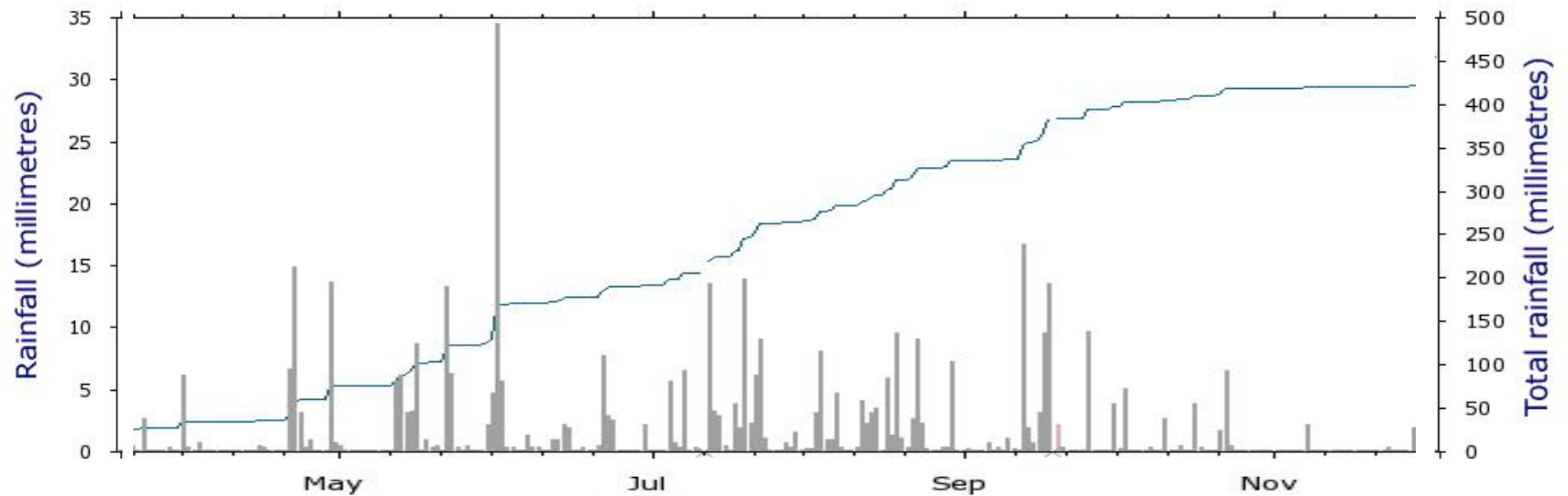
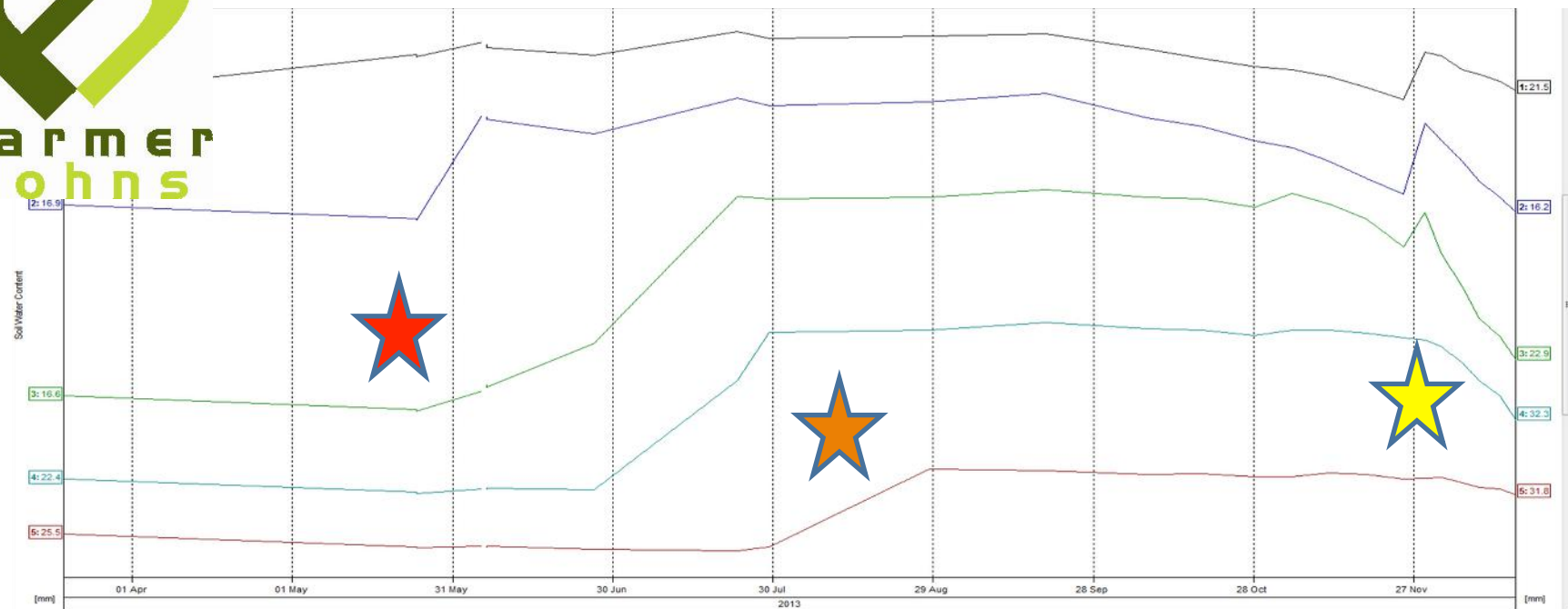
OCTOBER 1st





SENTEK DIVINER 2000

Example 2

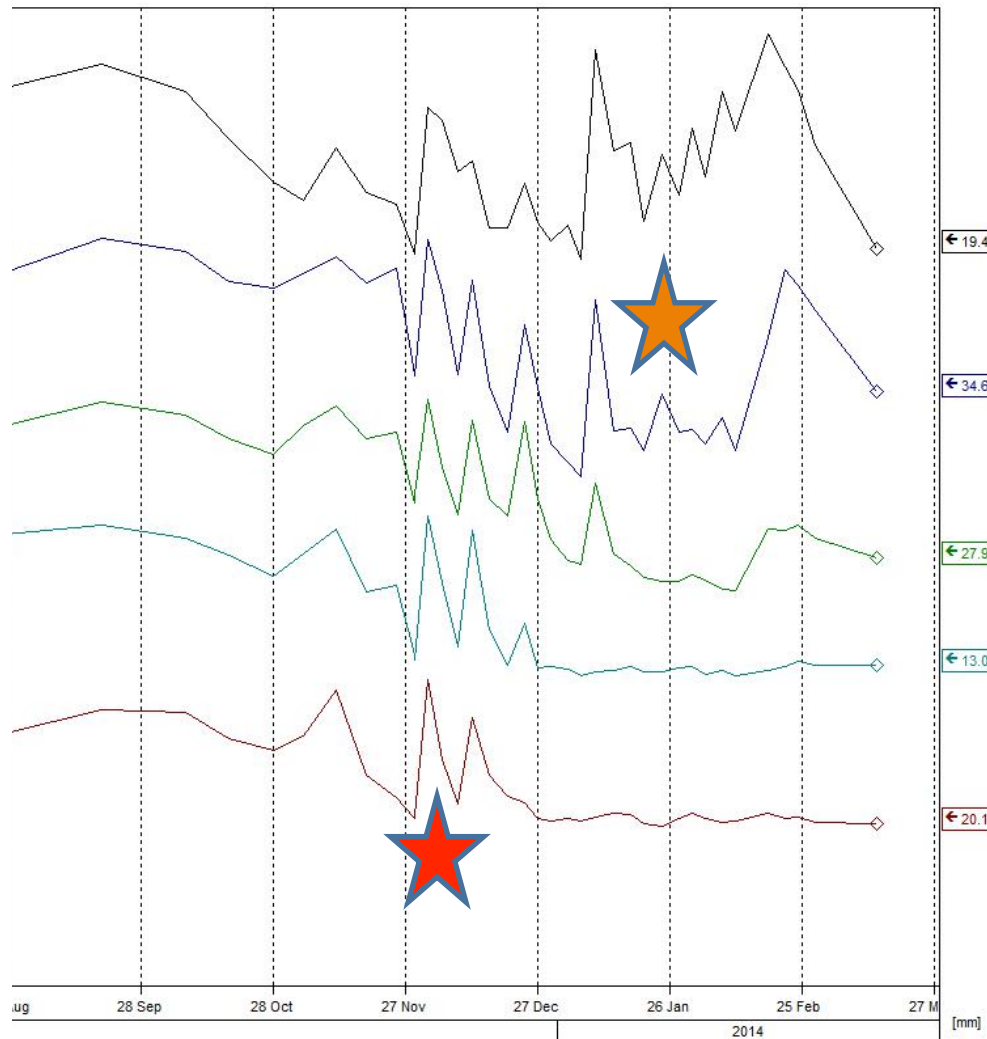




SENTEK DIVINER 2000

Example 3

Silty loam soil, near
Greenock, bottom of
hillside near a creek

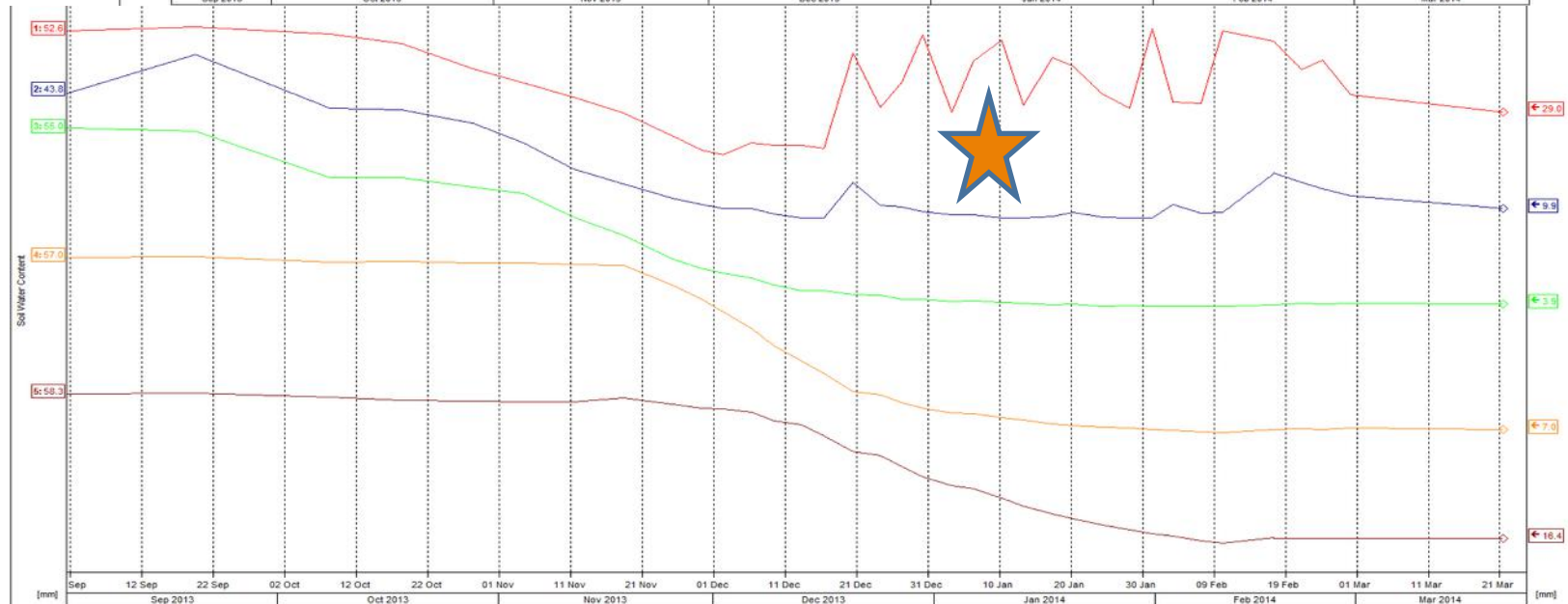
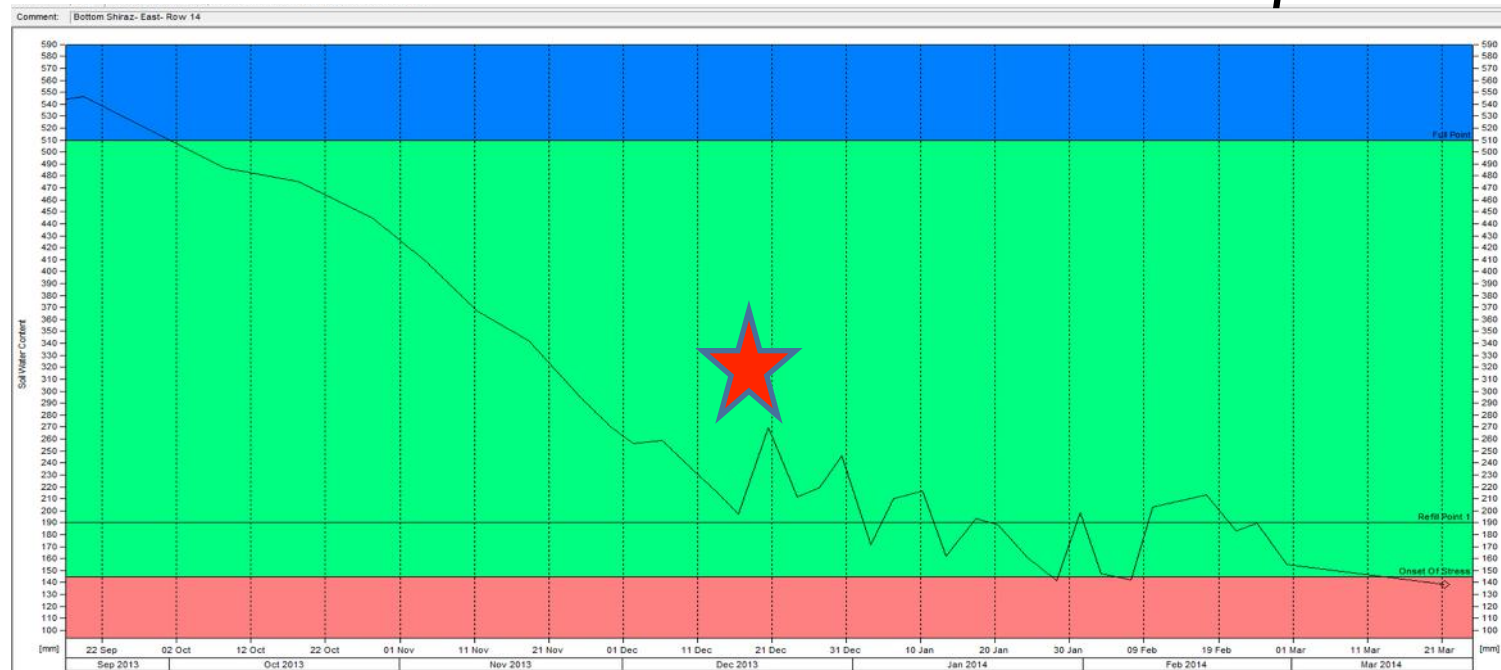




SENTEK DIVINER 2000

Example 4

Black Biscay
soil near
Tanunda





ENVIROPRO probe and ADCON telemetry



Continuous logging of readings

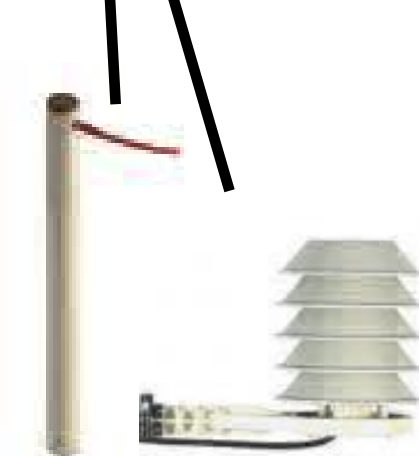
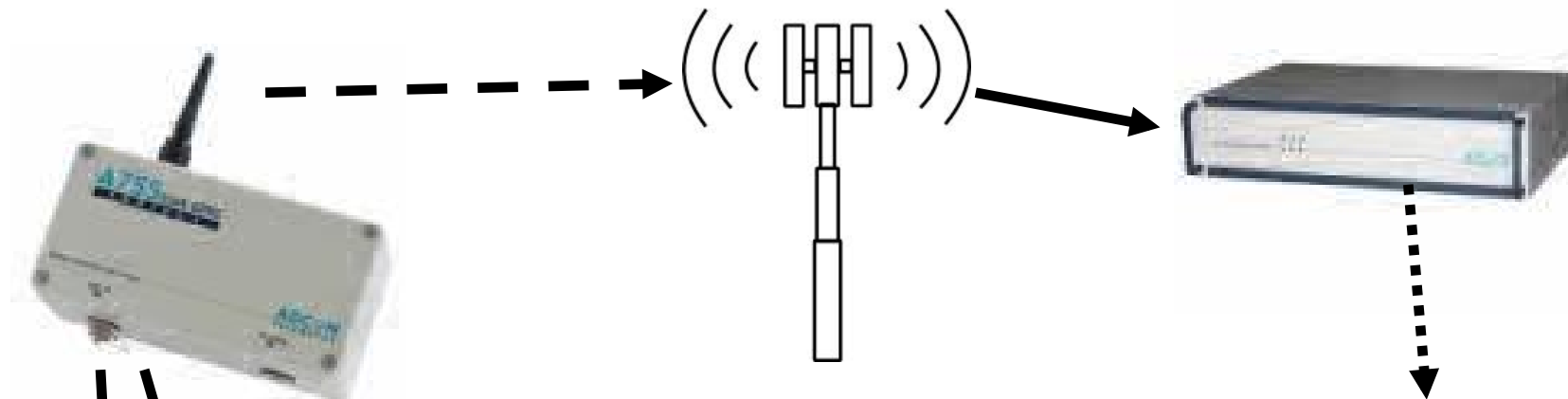
- e.g. every 15 minutes
- Sensor every 10cm
- Max. depth of 160cm
- Soil moisture and temperature, option of EC (salinity)

Remote telemetry of the collected data

- Near 'real-time' soil moisture readings
- Information is viewed online



ENVIROPRO PROBE ADCON TELEMETRY



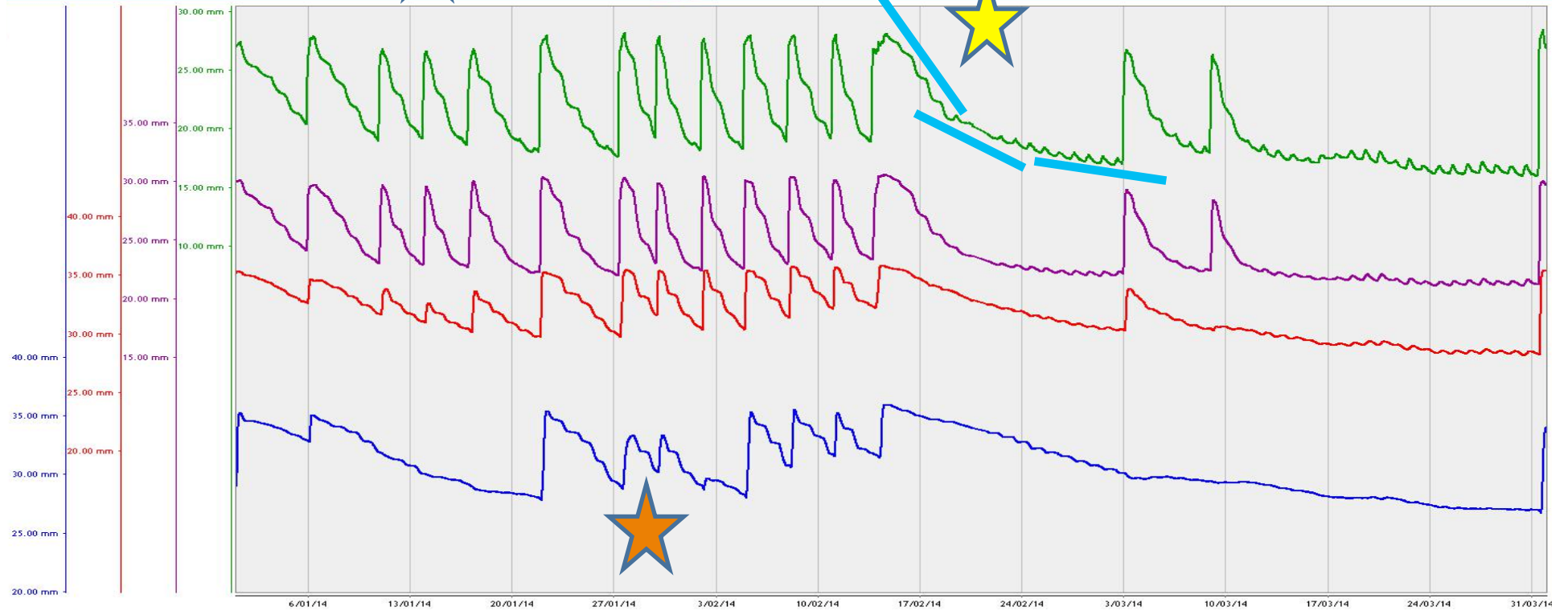
View data on the internet
near real time



Jan -
Mar

ENVIROPRO PROBE

1 Jan





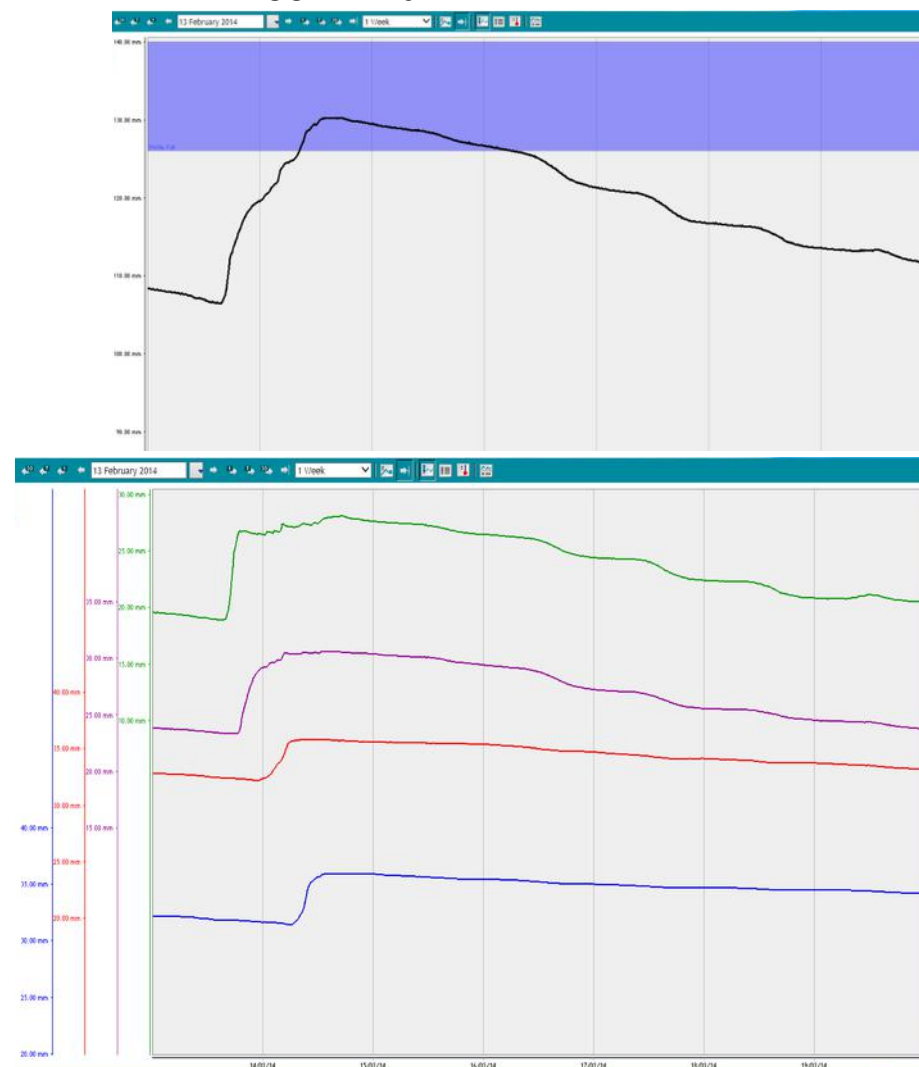
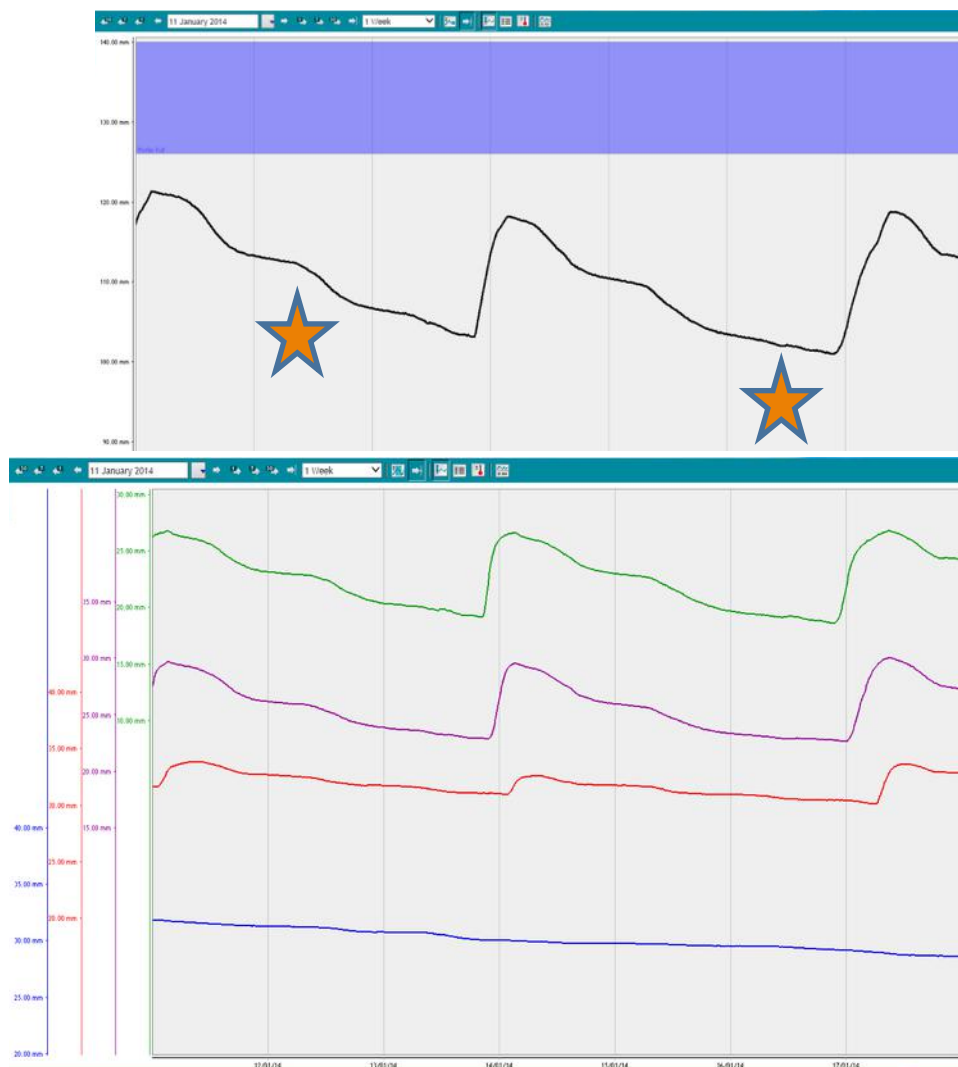
ENVIROPRO PROBE

11-17 Jan 2014

- Daily Max temps of 34-43°C
- Average Max 39°C

13-19 Feb 2014

- Daily Max temps of 19-26°C
- Average Max 23°C
- >100mm rain

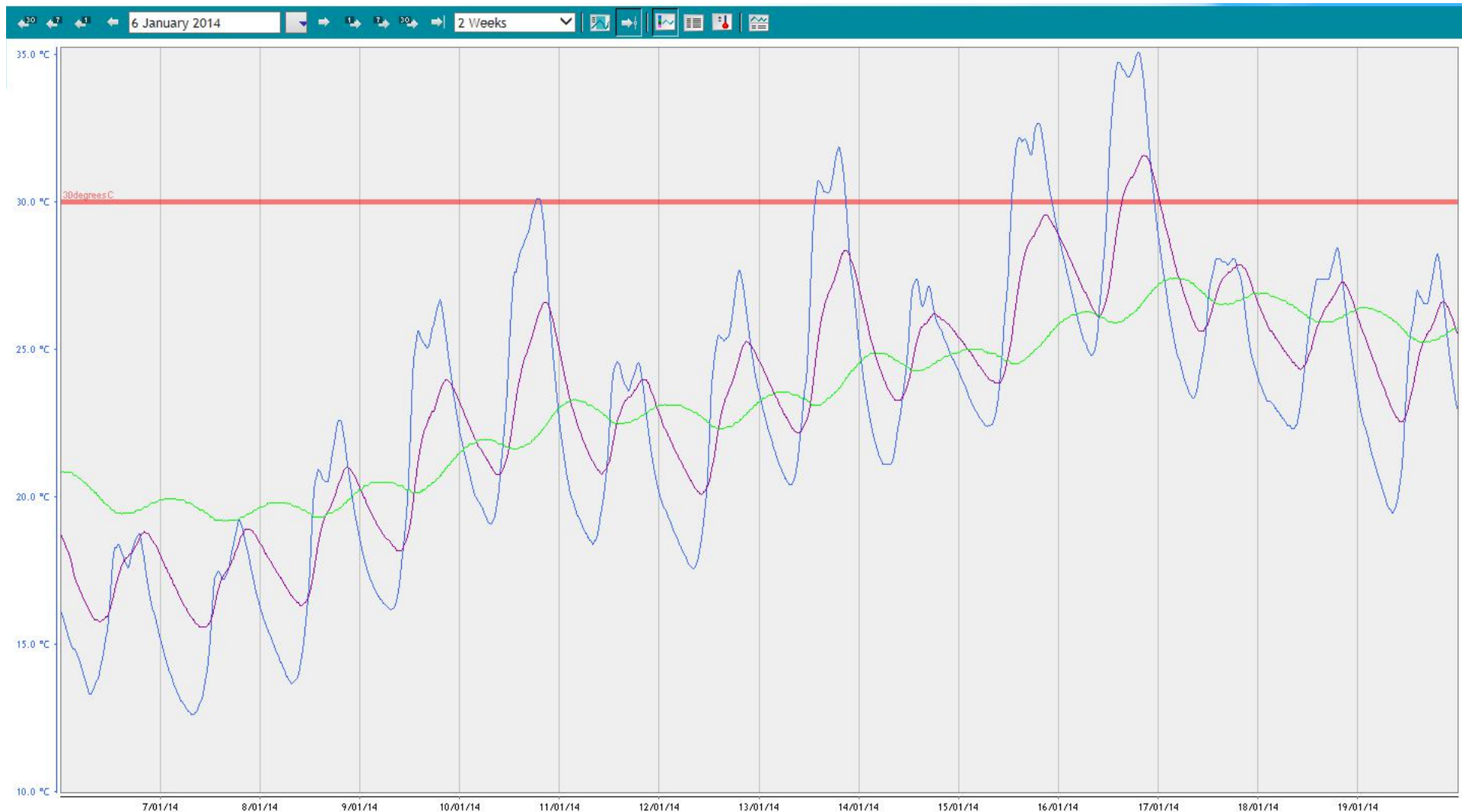




ENVIROPRO PROBE

Soil temperatures – Mid Jan

- Blue 10cm
- Purple 20cm
- Green 40cm





Summary

Soil moisture monitoring is a valuable tool to assist in irrigation management decisions in vineyards:

When and how much irrigation



Affect canopy growth and yield



Quality to meet customers needs

Yield for consistency of supply

Critical through dry seasons, heatwaves and when considering limited amount and the expense of water supplies



Services:

Soil moisture monitoring – Pest and disease monitoring – Soil testing – Tissue and Sap Testing – Nematode testing – Vine diagnosis – Spray program development – Sprayer calibration – Weed control advice – Vine nutrition

Suppliers of:

Crop and animal health products – Fertiliser – Winemaking supplies - Pasture and crop seed – Fencing and trellising – Water equipment – Personal safety – Pruning equipment – Hardware – Stockfeed