Background

Soil probes and associated weather stations are becoming increasingly important in assisting farmers to make better informed farm management decisions.

Three soil probes had previously been established on Kangaroo Island but given the extensive variation in weather across the island, the data had limited applicability to the district in which they are situated. This project has established an additional seven soil probes and weather stations across Kangaroo Island and has made the data readily available to local farmers (and the good news is another station will soon be added at Ritchie). This expanded network will enable farmers to make more informed decisions in an increasingly more variable climate, enabling them to maintain production and efficiently.

Results

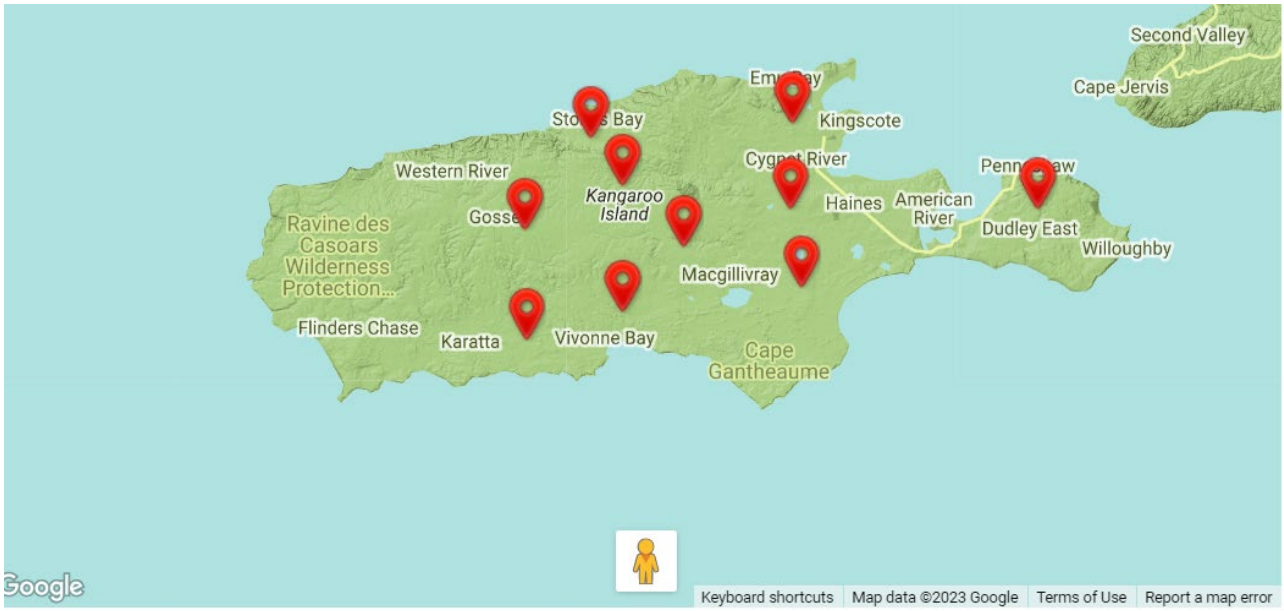

Figure 1: location of weather stations

The weather station data can be access via the AGKI website agki.com.au and go to the Projects tab. You can then access live data from each individual sites, or access summary data on soil moisture, wind speed, rainfall, Delta T and temperature across all sites.

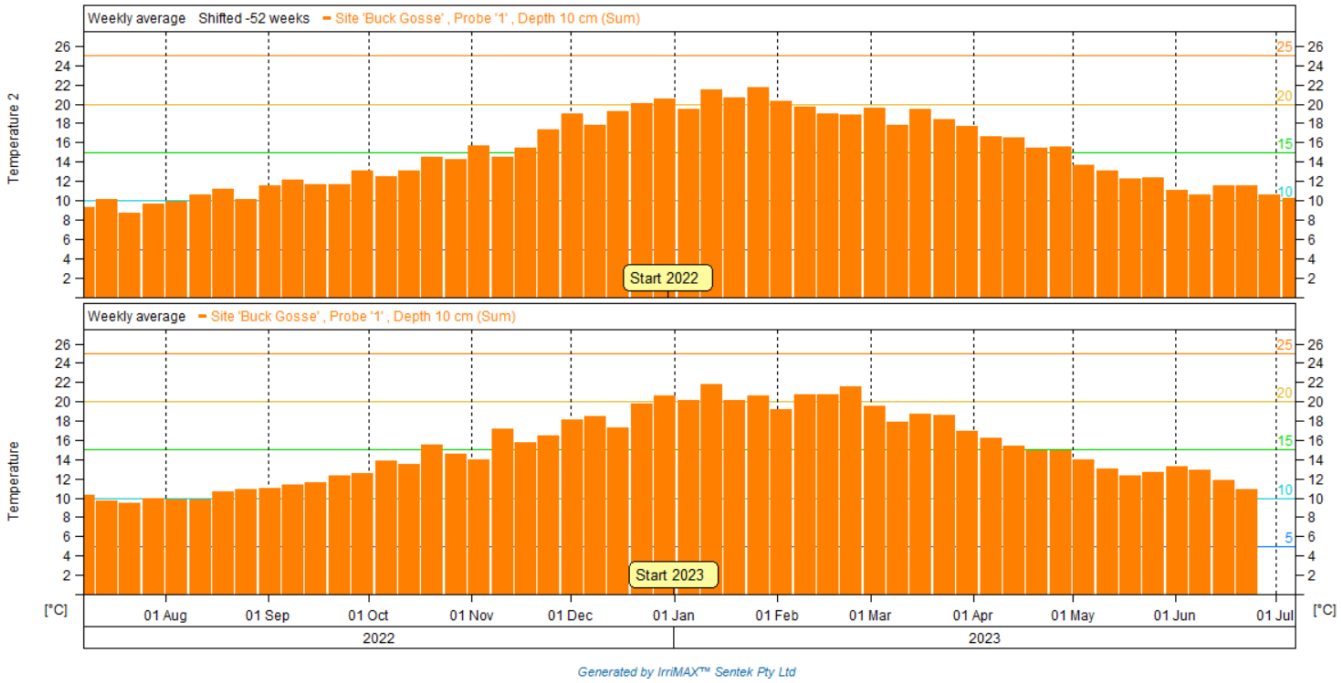

Figure 2: Buck - Weekly soil temperature, 365 day view

Figure 2 shows average weekly soil temperature at the top sensor (10cm below the surface). This data can give an interesting comparison of the variation of soil temperature not only over the course of a season, but also giving a comparison of temperature change from season to season. The current year is the bottom panel, with the year prior above. Ground cover (dry feed or stubble load) as well and air temperature conditions are the main drivers of soil temperature variation which has an impact on soil biota levels and nitrogen mineralisation.

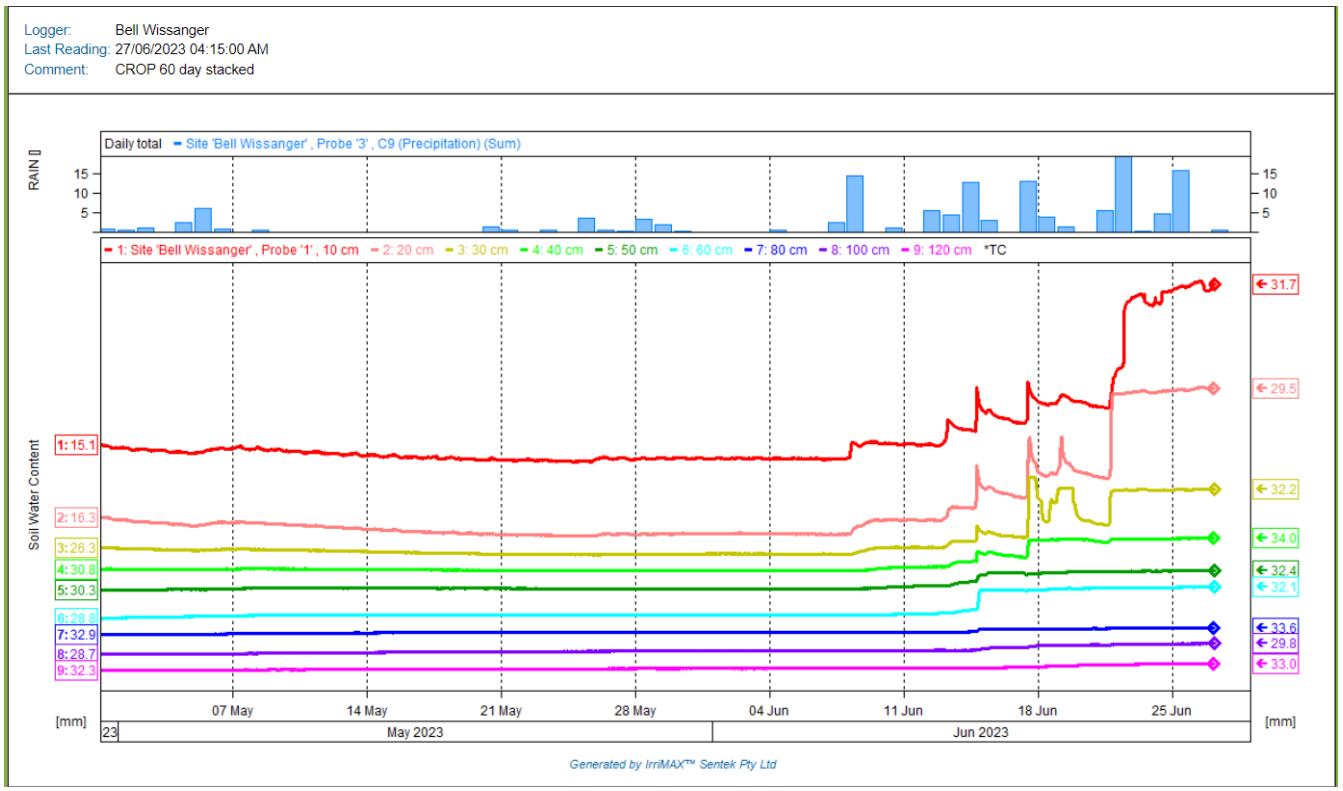

Figure 3: Bells - Soil moisture 60 day stacked

Figure 3 shows a 60 day stacked sensor graph for soil moisture in mm. Each coloured line is the reading from a different depth sensor from 10cm to 120 cm. The figures on the left-hand side of the graph show the soil moisture level 60 days ago and the figures on the right show the current readings. The bar chart at the top shows the actual rainfall events.

The graph shows the impact of the June rain, with a significant increase in soil moisture with heavy rain in late June in the top 20cm.

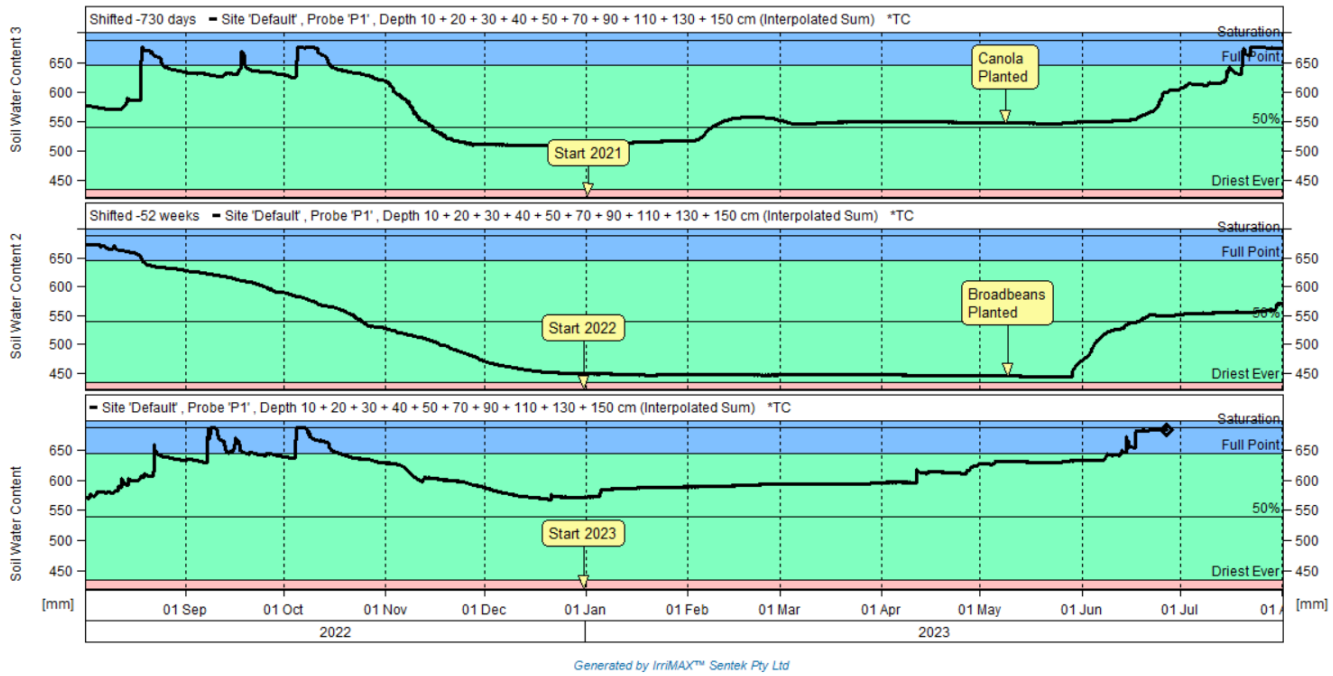

Figure 4: Bells – summed comparison graph 365 days

Figure 4 is a year on year summed graph comparison which shows the ‘fuel gauge’ view, with the current year in the bottom panel and the mid panel is essentially shifted back a year. The top panel is shifted back two years. This enables one to draw a line vertically to intersect the graph and see how much moisture there was at the same time last year. Once a number of seasons have passed, Full Point (drained upper limit) and Driest Ever (crop lower limit) can be calculated and then the 50% horizontal line gives a clearer indication of moisture left in the profile. This data can be used to give a close approximation to plant available water in mm for the depth of the soil probe (keep in mind that roots may go deeper than the bottom of the soil probe).
The steepness of the graph during the critical September/October grain fill period is the most interesting observation on this graph.

Take home messages
Weathers stations can provide useful information to base farm management decisions on:

- Delta T – a measure of evaporative potential to determine if weather conditions are safe for spraying pesticides
- Weather conditions for high mortality risk of sheep (a Sheep Chill Index).
- Fire danger risk which can be used at crop harvest to determine if weather conditions are safe for harvesting.

Check out the AGKI website and save it as a favourite on your phone.

Funding/Sponsors
This project is being delivered in partnership with Livestock SA, Agriculture Kangaroo Island and Department of Primary Industries and Regions. It is jointly funded by the South Australia and Australian Government's under the National Disaster Recovery Funding Arrangements.

Further Information

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