

EP Soil Moisture Probe Network - summary of monitoring for three years

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Key messages

- **Live information for each of the soil moisture probe sites is available at: <https://eparf.com.au/> then click on the yellow Soil Probe Network icon in the top right hand side and logging on using the user name: EPARF and password: EPARF.**
- **Soil moisture probes demonstrated the benefits of summer weed control.**
- **Soil moisture probes showed that pastures and pulses generally used less soil water than cereals.**
- **Soil moisture probes helped growers better understand plant water use and availability on their soils.**

Why do the trial?

This project helped to develop a network of soil moisture probes across Eyre Peninsula with the aim of providing farmers with information on how they can use the soil moisture probe data to improve their profitability through more informed decision making. Soil moisture and rainfall are key drivers of both grain and pasture yield on Eyre Peninsula. Improved understanding of how a given soil type is able to store water and then

how crops or pasture can then utilise that water should provide some indication of how effective management strategies are. This article builds on the article Soil moisture probe network - using soil water information to make better decisions on Eyre Peninsula from EPFS Summary 2017, p59.

How was it done?

In September 2016 a network of soil moisture probes was created across Eyre Peninsula by linking new and existing (EPNRM and LEADA funded) soil moisture probes and providing access to the data via the EPARF website. The network currently consists of 37 probes in locations representing most major soil type/environments across Eyre Peninsula.

In addition, weather stations capable of logging temperature, humidity and wind speed have been installed at 16 soil moisture probe sites funded through contributions by EPARF, AgFarm and GRDC. This data can also be accessed by logging into the soil moisture probe network via the EPARF website.

Sites adjacent to each probe were soil tested in March/April (2017, 2018 and 2019) for soil chemistry and pre-seeding soil moisture. Further soil testing was conducted around crop maturity (October/November 2017 and 2018) to determine the amount of soil moisture left at the end of the growing season.

What happened?

This project was able to determine plant available water capacity of major soil types at 29 sites across

Eyre Peninsula and created a live platform to view soil moisture and meteorological data at 37 sites.

Much of the information generated relates specifically to the part of the paddock where the soil moisture probe is located and will have most relevance to the grower whose property on which the probe is located. However, the data is also relevant to other growers with the same soil type and in similar environments to each probe.

There were many commonalities across sites and this project was able to demonstrate that soil moisture probes were able to:

1. Demonstrate the benefits of summer weed control

The soil moisture probe rainfall gauge indicated that 36 mm of rain fell between 5-7 February 2017. The soil moisture probe was able to show that all of this rainfall was removed (mostly by summer weeds) by 20 February 2017 (Figure 1).

2. Demonstrate the effectiveness of different crop types in extracting moisture

The paddock around the probe shown in Figure 2 grew wheat in 2018 and it can be seen that this crop had used the maximum amount of water ever recorded at this site, by late October. The heavy line going straight through the plot a bit below halfway was the maximum amount of soil moisture that a field pea crop was able to use in 2017. This was quite common at most of the probe sites where pulse crops and pastures did not use as much soil moisture as cereals and canola crops.

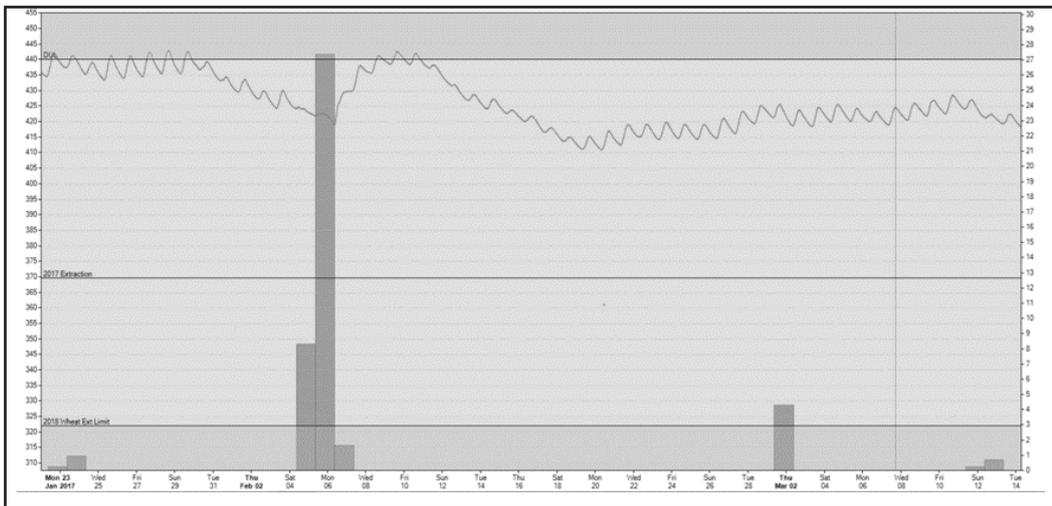


Figure 1. Total soil moisture present at a probe site (serrated line near top) during February 2017. The solid bars show rainfall.

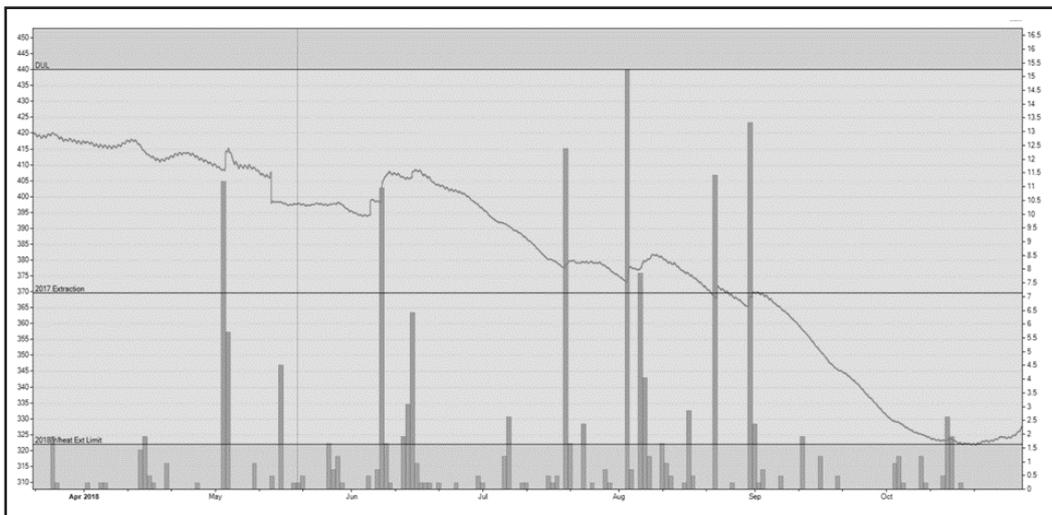


Figure 2. Graphical representation of soil water at a site in 2018 (the line gradually declining from left to right). Solid bars show rainfall events.

What does this mean?

A survey of 106 growers and advisors conducted in March 2019 indicated how they would use the information the soil moisture probes generate for decision making. A summary of their responses is listed below:

- N application x 7
- Grain marketing confidence increased x 2
- Time of sowing decisions
- Weather Stations (including FDI) x 3
- Summer weed spraying x 3
- Increased confidence of sowing
- Risk management - dry sowing knowing moisture at depth, confirm gut feel
- Target yield, knowing bucket size
- When we have enough confidence, it will help us make every decision

- Measuring WUE and stored soil moisture to know what's going on
- Know where frost has occurred (quicker decision can be made)
- Crop choice at start of season
- Towards end of season - how much is left for pasture/crop

The authors appreciate the feedback farmers and advisors have provided on how the soil moisture probe network could be improved, especially in relation to the how they can access the data, additional information they would like to see and how it is presented. These will all be addressed as part of the new Australian Government's National Landcare Program Smart Farm Project: Resilient & Profitable Farming on EP, so that the soil moisture probe network evolves to become a highly useful resource providing live, easily accessible information that will improve in-season decision making.

Acknowledgements

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