



ResilientEP
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FARMER CASE STUDY THEME: STORED SOIL MOISTURE, YIELD POTENTIAL AND HOW TO MITIGATE RISK

Case Study: Understanding stored soil moisture.

Summary/Purpose

In this case study, Paul Schaefer shares his experiences and insights on his involvement as a focus paddock for the Resilient Eyre Peninsula Project. Running livestock on his property as well as cropping barley, canola, vetch, lupins and medic pasture rotations, the success of his operations is heavily influenced by stored soil moisture leading into the growing season. Chasing yields with high inputs is risky due to the impacts of potential frost and heat events in the region. To mitigate this risk Paul has strong medic rotations to ensure a good N background.

Context

The Schaefer family's 4500-hectare enterprise, *Nalino*, in the Pinkawillinie region on the central Eyre Peninsula, includes livestock as well as barley, canola, vetch, lupins and medic pasture rotations. Paul's involvement in the region's moisture probe network came about following communications via the team at EPAG Research. At the time, Paul was looking to investigate challenges he was experiencing with his crops. Unsure whether they were related to nutrition or moisture, he wanted to know more about what was happening underneath his soil surface.

EPAG Research agronomist Jacob Giles explained, focus paddocks were chosen based on the willingness of growers, but more significantly due to the ability to represent a district and to achieve demonstrable outcomes that would be beneficial to other growers similarly affected. Paul's site at Pinkawillinie was felt to be representative of other properties in the area where growers implement mixed farming systems to help offset risk as best as possible.

While soil type variation is a challenge across Paul's property, he does not apply variable rate application of N. He feels the size of the variable areas and the input of time and cost does not represent a worthwhile return. According to Jacob (EPAG Research), this is a common view amongst growers on the upper Eyre Peninsula, as inputs are generally low to begin with and areas of land farmed are large. The grower does use a variable rate at sowing for phosphorous and nitrogen.



The mixed farming system on the upper Eyre Peninsula has seen many growers succeed with a sustainable business structure. Sheep provide income in poor years to maintain cashflow. Failed crops can be cut for hay to be fed out in dry spells and annual cropping input costs are moderate as input costs (fertiliser, chemical and fuel) are required over a smaller proportion of land.

Approach and methodology

In setting up the focus paddock, Paul has been left to run the paddock based on his chosen rotation and treat the site as any other normal paddock. The team at EPAG Research have done the leg work involved in set up and analysis. Paul has had the opportunity to provide as much or as little feedback or input into the process and he has found the overall experience of working one-one with researchers to have been extremely valuable.

He has appreciated the connection to researchers and the space to bounce ideas around as well as to provide feedback and help to “steer them” as to where growers feel they need to direct their efforts. Often trial sites are set up on growers’ properties with no further communication. Paul said the “direct contact with researchers has been excellent.”

Based on involvement in the process, Paul made the decision to add an additional probe in the paddock adjacent to the project focus paddock, at his own expense. He said this has been really interesting in being able to observe how different crops react to the same amount of moisture. He said this has been really important to their pasture management system, ‘to make sure we spraytop, late in spring to avoid using precious summer moisture.’

Impact/Benefits

The moisture probes have given Paul confidence to do summer weed control, knowing that money spent on summer spraying is beneficial. He explained that after spraying a paddock and reviewing the probes data, several days later, he can see moisture has stopped draining out the soil profile. The moisture probes have given him confidence to make these decisions.

He said, the level of information available from the moisture probes was unexpected and its value has been “really excellent.” In the past he did not often make changes to set plans, whereas now armed with this type of information he would “base rotations on the moisture available rather than just a guess.” Previously, Paul said he had been caught out, letting pasture die off. He explained that having the two probes on paddocks, side by side, has shown that a wheat crop once it is ripe, stops using moisture, but the pastures can continue draining moisture for a long time, sometimes into January, which means a lot of moisture is needed to recharge the system. Paul is more likely to spray pastures out earlier, even if there is some feed left, to conserve moisture. “This was something that we thought we knew we needed to do but didn't do as much as we should have in the past,” he said.

In terms of long-term planning, Paul is hoping to re-introduce canola back into his system after not sowing it for several years. He explained canola had generally been a risky crop in the region and has not been a huge part of his rotations. With the data from his moisture probe, he now has the confidence pre-sowing, to better understand available soil moisture. He can sow canola dry and given an average season he can expect to still realize a return.

Adoption and practice change

Moisture probes have highlighted there is still a lot to be learned about what is happening beneath the surface. They are relatively inexpensive to install, and Paul said they have provided him “really good insight into what moisture is available.” They have allowed him to track moisture over time; demonstrated how much water he has saved and how much can potentially be lost due to poorly timed spray applications.

Paul has a better understanding of his soil’s PAWC, which is noted to be good relative to rooting depth. Stored soil moisture at this site is highly valuable. The ability to measure in season is less valuable to Paul. Related outcomes are often dictated by weather during critical stages rather than any other factor. Inputs are also relatively small due to a strong medic pasture history. The value in these decisions becomes more important as larger areas, having a greater variability, are farmed and the scope to scale decisions based on PAWC is opened up.

Relevance to others

Several groups of researchers and farmer groups have visited this focus paddock, as well as regular crop walks organized through the local Ag Bureau. Jake Giles and the EPAG Research team provide updates at local Ag Bureau days about what is happening on the paddock and how that affects other growers in the area. According to Paul, the region has seen a “pretty big uptake” of moisture probes off the back of this project. In addition, the local Ag bureau is developing a moisture probe network. He said there has been a lot of interest in general with “growers extremely interested in what’s happening and how that might affect their farms.”



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For the full case study report go to www.airep.com.au