South-West WA Drought Resilience Adoption & Innovation Hub

AgTech Decoded: Growers critically analysing the role of new technology in on farm decision making – What are the possibilities?

Case Study Report – Dylan Hirsch

Purpose

The purpose of this case study is to provide an insight into how growers have utilised data-analytics to inform in their decision making process. Growers lack the time, tools and skills to process, visualise and use different sources of data in an efficient manner. However, the 'AgTech Decoded' project has allowed local growers to better understand digital technologies and how they can be used for a research and development purpose.

Introduction

Australian grain growers are constantly required to make effective decisions in their farming businesses. Data analysis has been an increasingly utilised tool for farmers to improve their enterprises. Liebe Group and Stirlings to Coast Farmers have collaborated with CSIRO to increase grower awareness and knowledge of with the soil moisture probe technology and the establishment of a local network for best practice decision making.

Dylan Hirsch is a local grower and member of the Liebe Group. After working in the mining industry as a qualified engineer, Dylan transitioned into agriculture, firstly taking up a position with CBH before moving back to his family farm. Located in Bunjil, approximately 80km NW of Dalwallinu WA, Dylan has been involved in his family farming business for the past 5-10 years, cropping over 6000 hectares.

Key issues and findings

Dylan Hirsch met with Liebe Group staff Chris O'Callaghan and Aeneva Poulish on Wednesday 26th April 2023 alongside research scientist, Roger Lawes from CSIRO to discuss how growers can better improve their farming business practices by using agricultural technologies. As conversation commenced, Dylan expressed an interest in the adoption of the 'Agricultural Production Systems Simulator' (APSIM) interface which could "put some real numbers to those gut feel decisions".

Over the past 18 months, the Liebe Group has invested in a network of 14 soil moisture probes and water stations to improve their members understanding of soil water dynamics and water use efficacy. The AgTech Decoded project commenced in June of 2022 with the aim to explore the use and integration of this network to discover the tools required to improve farming practises.

> *"I want to put some real numbers to those gut feel decisions"*

Throughout the discussion, Dylan highlighted the importance in having a platform that integrates the existing soil moisture information from the probe as well as the assumed rainfall for the year that can create a 3-month modelled forecast at a "click of a button". He also highlighted the importance of having a live yield prediction available to the growers who are involved in the soil moisture probe network.

Dylan said that he would not require a platform/interface to know everything about his soil type, as he doesn't believe that to be necessary. Rather, a sliding scale that could adjust the algorithm according to the water holding capacity that could map the predicted yields to relatively match the historical yields. "I think if we are talking about building an interface to be as intuitive as possible for everyday use, it needs to be easily customizable so that they reflect what the grower sees."

Dylan expressed his interest in data management and visualisation software that has been implemented in the East Coast. "If you are talking about looking at data, data management and presenting data. I have been intrigued by products such as the 'Pairtree Intelligence'. Their interface seems to be customizable, because if I'm making decisions on budgeting, marketing, insurance, input, planning, I want a tool that I can neatly visualize." Dylan mentioned that he would not require this technology to be live down to the minute. However, he would prefer that he can have all of the information available in the one place.

It is apparent that growers spend a great amount of time switching between search engines and subscriptions to find information. "Being about to see the weather forecast as well as how my moisture probe is going, I know how quickly my crops are using up that moisture in season. If I can see that the wheat prices have moved in the last weeks as well as how the soil moisture has changed with the weather predictions, we are looking at a $200 hectare gross margin change in one week."

"If there was a $1 million budget on an interface that could be easily accessed. It would be really handy to pull in the biomass imagery indexes as well. It would be useful to see the difference between the APSIM models year to year to compare crops and paddocks. What we like about the weather station and soil probes is the digital storage of rainfall data. This eliminates error which means I know that I can use that to verify the combination of the rainfall gauges. This hasn't changed our decision making processes yet but I think we are only a couple of years away."
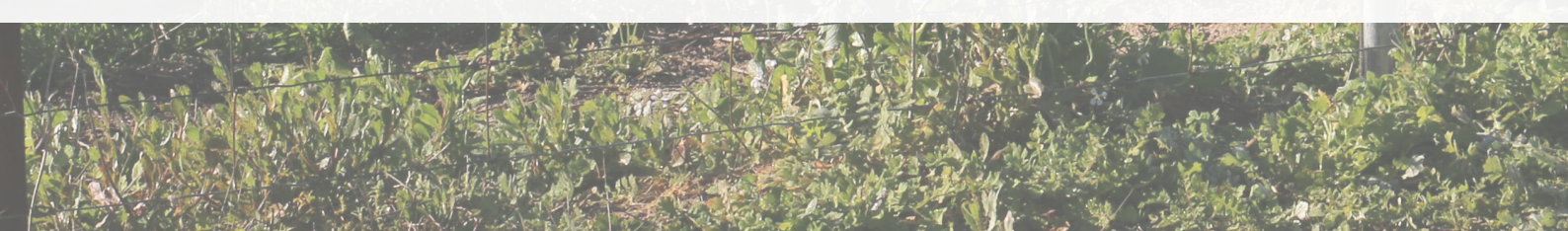
Looking into the future, growers would like to have the tools available to allow them to manage their farming business, while being away from their farms. Having the technologies that can aid farmers to make decisions remotely would be beneficial to their business practises as well as their personal livelihood. This would not solve the ongoing barrier of labour management that most growers have been experiencing in the region, however it provides a platform to make more informed decisions.

Dylan identified additional barriers to his farming business to be purchasing more soil moisture probes (to allow better coverage of his farming area, he believes he would require more) and weed burden and disease status mapping through green on green cameras. "My biggest return on investment is not necessarily the actual spraying of the products and the savings, it's the long term data that I get on that paddock. What would be great is if I had a drone which could give me a 1 hectare resolution on ryegrass or radish densities across paddock level over three years. It would help me to make applications of herbicides and plan them accordingly. If I know I've got high density weed infestation in a small portion of the paddock and I know exactly where it is, I can plan my pre and post emergent options very effectively."

Summary

Technology has significantly improved in the last decade, providing a sign of hope that it will continue to develop in the coming years. Growers put great amount of value and trust into these technologies, however there is a noticeable lack of fulfilment from WA farmers to make informed decisions as they have been based on 'gut-feel'.

Dylan is interested in an interface that can combine his soil moisture probe with on farm weather station data and have an APSIM simulation to provide historical context which will also involve the weather forecast to give an effective layer of information for the seasonal decision making. Using this information to help inform various decisions in farming business, with weather derivatives and customizable features being the predominant components of an effective decision making tool . "As a farmer, I'd be not scared to try those things, but scared of relying on those things because I don't know what its limitations are".

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