

CASE STUDY FIVE

PA benefits shine with scale

Setting up collaborative farm Bulla Burra with the Gladigau family in 2009 gave Robin and Rebecca Schaefer the scale to further explore PA technologies.



Farm profile

Farming personnel: Bulla Burra, a collaborative enterprise owned by Robin and Rebecca Schaefer and John and Bronwyn Gladigau

Farm location: Loxton and Alawoona, South Australia

Annual rainfall: 275 millimetres

Farm areas: 10,000 hectares managed, 8500ha cropped

Soil types: Sand and sandy loams

Topography: Mallee dune swale

Enterprises: Wheat, barley and lentils

Average wheat yield: 1.6t/ha

SPAA member: Yes

PA consultant: Mostly done in-house

Agronomy consultant: Danny Conlan and Sean Matthewson, Dodgshun Medlin

Why did you choose to adopt precision farming technology?

Our soil types here are highly variable. They go from deep sand to good mid slopes – our highest yielding country – to constrained flats where roots can't penetrate hostile subsoil layers. As a result, we see quite significant variation across our crops. The reason I originally started exploring precision agriculture was to try and measure that variation and then manage it. That was initially done by yield mapping and then using

PA timeline

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|------------------------------|------|
| Variable rate – | 2002 |
| Guidance – | 2004 |
| Yield mapping – | 2004 |
| Autosteer – | 2006 |
| On-farm trials – | 2007 |
| Optical spot spraying – | 2013 |
| Controlled traffic farming – | 2016 |
| Inter-row seeding – | 2016 |

those maps to prescribe treatments. Even before we started yield mapping in 2004, we had variable rate capacity on our airseeder so I went out and manually set up some zones which I knew had big yield differences and needed to be managed differently. Yield mapping quantified that and then we could further finetune our inputs. We did some electromagnetic mapping in 2005 which gave us a feel for variation within our properties. We haven't EM mapped everything but because we are building up layers of data, we have been able to create zones.

Which technology tools or components have you adopted and (which do you) continue to adopt?

Joining together with John and Bronwyn Gladigau and setting up Bulla Burra in 2009 really gave us the opportunity to

Top PA tips

- Use PA tools to map variable soils
- Optical spot spraying has resulted in significant chemical savings
- Use social media to think outside the square and explore other opportunities

transition even further into precision ag and to make use of the technology a lot sooner than would have otherwise been the case. Because of the scale of the combined operations we could afford to do it. Our next move was into variable rate spraying in 2009, targeting areas of higher weed population with higher rates of chemicals or different chemistries. The next step was data analytics in 2015. All of our machines were connected with modems which enabled us to collect data and analyse the machine's performance and monitor staff movements with machines such as diesel usage and fuel level. All of that is done through John Deere Operations Centre. We purchased a WeedIt in 2013 to help us manage summer weeds on fallows and prior to cropping. The latest technology we have adopted is on our new self-propelled sprayer purchased in 2018, which has pulse width modulation, allowing us to control droplet size on the go and maintain a constant spray pressure and constant spray quality despite the ground speed.

What are the factors that motivate you to adopt and use each of the different tools or PA components?

At the end of the day it has got to be profitability — that is the key driver. The next one is being able to better manage and measure what's going on so we can make better decisions. A classic one was when we purchased the WeedIt. We worked out what it would cost us to own the machine and finance it. The WeedIt really had to pay for itself and earn a return on investment. We knew what the cost per hectare was to own it so we believed we could make a saving to justify the purchase of the machine. Once we got the machine, we did the sums and it did indeed justify and pay for itself. It worked out better than we initially thought because we assumed the technology would become obsolete fairly quickly, however it retained its resale value which helped the final numbers.

What types of data and information are you collecting to guide your decision-making to adopt or not adopt each PA component?

It depends a lot on what the PA component is. The key driver is yield at the end of the day — that's where the rubber hits the road and it's your bottom line. For something like the WeedIt, that's the data of what we are spraying, where we are spraying and when we are spraying so we can monitor what we are spending relative to what we would be spending against a blanket approach. Good data collection allows us to analyse and make the best decisions.

Has the adoption of PA increased profitability on your farm? How?

It has. In terms of how it has increased profitability, again, it really depends on the type of PA tool being implemented. Some tools can increase profitability in direct cost savings, such as our WeedIt. A lot of the time we might go out and only spray 10-15 per cent of the paddock against a blanket application. That's a saving as opposed to a yield increase. The same can be said for variable rate because we are not applying as much fertiliser on areas that aren't productive but can potentially increase productivity on areas that are more responsive to fertiliser.



How are you using the data generated by PA? Is it leading to further practice change? If so, what kind of practice change?

Data helps us to make better informed decisions and has led to further practice change. A recent example of that is deep ripping. We purchased a deep ripper this year and so have used the data generated by PA to identify areas of sandy country where we could get the best return on investment for deep ripping. Using yield maps, we could identify sand hills which have been consistently poor with dry springs. We tried different fertilisers and ran checkerboard trials across sand hills and none of that was working, so we worked through what was causing the issue and now we are deep ripping.

Who is influencing or assisting you with the adoption of PA?

SPAA is a big influence. I go along to the conferences and I'm on the committee, so I get to talk to a lot of other likeminded farmers. Social media is really good now too as that allows you to find out what other people are doing, think outside square and look for other opportunities.

Are you planning to adopt more or less of these various precision farming technology components in the future?

A lot of research happens on our property through Mallee Sustainable

Farming, the universities, SPAA, the Australian Controlled Traffic Farming Association and CSIRO. One of things we are looking at with CSIRO this year is penetrometers linked to GPS to get a closer understanding of where compaction is in our soils. We have done some work looking at NDVI and we are working with CSIRO on the Future Farming Project to get a better handle on nitrogen management. Because it's so dry here we don't get much opportunity to influence the crop once it's in the ground so we are using some analytical tools to work through where crop needs more nitrogen and when.

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- Conversations with Farmers: Agricultural Practice Change with the "PA-Early Adopters"

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