PA tools
'money in the pocket'

The adoption of precision agriculture technology has enabled Brendon and Denise Johns' business to expand, streamline efficiencies and increase profitability.

Farm profile

Farming personnel: Brendon and Denise Johns

Farm location: Warnertown, South Australia

Annual rainfall: 340mm

Farm area: 4100 hectares

Soil types: Sandy loam and clay loam

Topography: Gently undulating dune/swale sandy loam soils and clay loam flats

Enterprises: Wheat, barley and lentils

Average wheat yield: 2.7t/ha

SPAA member: Yes

PA consultant: Sam Trengove, Trengove Consulting

Agronomy consultant: Sam Trengove, Trengove Consulting

PA timeline

Guidance –	2003
Autosteer –	2003
Yield mapping –	2005
On-farm trials –	2005
Variable rate –	2007
Inter-row seeding –	2013
Optical spot spray (Weedseeker) –	2017

Top PA tips

- *Use maps and data to manage different zones according to their own unique needs*
- *Optical spot spraying technology has led to chemical savings of up to 90 per cent*
- *Read and listen widely and surround yourself with good people to further your knowledge*

Why did you choose to adopt precision farming technology?

Our foray into precision agriculture was originally to enable spraying at night and progress from a foam marker by fitting the spray tractor with autosteer. It was a natural progression but has since become a part of our business' day to day operations.

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

Autosteer and GPS guidance were the main ones initially. It took us about a decade to get autosteer and inter-row sowing on the seeding tractor and bar completely right, but we have been very satisfied with it since 2013. We were finding we had limited success with inter-row sowing using front-wheel assist tractors combined with a tow-between aircart and Concord bar. We made the decision to move to tracked tractors with a DBS bar and tow-behind aircart which seems to have helped us get better results with inter-row sowing. By using a single-track machine and taking away the pivot points it seems to work better for us.

This has also helped us in our conversion to a two in one controlled-traffic farming system, with most of our machinery now operating on multiples of 12.2 metres. Our seeder is 18.3 metres wide and our sprayer is 36.6 metres wide. That has been an evolution for us over the last five or six years and creates a certain farming skill level which the staff learn to follow.

Another recent adoption has been optical spot spraying technology for summer spraying. We purchased a second-hand Weedseeker in 2017. We are seeing massive savings with that of up to 90 per cent in chemicals. That machine has the best rate of return for any PA equipment we've purchased and has provided the quickest return on investment.

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

I am motivated by the improvements in efficiency we get from PA technology. It makes the job easier for staff, saves money and keeps our business moving forward. If we don't move forward then we get left behind.

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

Yield maps are our main source of data. They ground truth what we're doing. We also use NDVI maps to help us check and measure responses to different input applications we have done. Both yield maps and NDVI maps are great validation tools which help us determine if we are doing the right thing and getting a return from the adoption of different tools and methods.

For example, on our dune/swale country, the data from the maps is indicating we need to manage our sandhills better, so we have gone down the path of deep ripping with inclusion plates and applying chicken manure in those parts of the farm. The data helps us to manage different parts of paddocks the way they need to be managed in order to maximise yield. It costs us $200 per hectare to freight and apply chicken manure and the purchase of the deep ripper is a significant investment as well, so we need to make sure we are getting a return on those investments.

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

I think PA has increased our profitability. Our business has continually expanded since we started adopting PA technology. It makes machinery easier to use and allows us to work around the clock during busy periods to an improved standard, which we couldn't do without it. Technology such as the Weedseeker just puts dollars in our pocket – the savings we are getting from it is massive.

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

The data from the NDVI maps and yield maps has led us down the path of deep ripping and chicken manure spreading. We have also started pH mapping this year with a Veris machine which will help

us in adopting variable rate lime or gypsum to target acidic patches in paddocks.

The data helps us manage paddocks in zones. We have a number of blocks spread up to 40 kilometres apart and no two blocks or paddocks are the same and therefore nothing is treated the same. Different zones get treatments unique to them to maximise yield and return.

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

Our consultant Sam Trengove helps us with the implementation of different PA tools. But personally, I am continually trying to build my own knowledge by reading, listening and surrounding myself with good, positive people.

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

We probably do less variable rate in-crop now than what we did in the years when we first adopted it. We have found that crops were less responsive where phosphorous levels were high, so by limiting those inputs on areas with high levels we were limiting our crop yield.

The pH mapping will help us to identify problem areas of soil acidity and see what is required. We will do 400ha this year and see where that takes us.

We were going to purchase protein meters last year but due to the poor

season we didn't, so that is something we will look at again this year. I see that as a valuable tool in helping us manage our on-farm storage and what grain goes where. I look at that in a similar way to the Weedseeker. Where a lot of PA tools are profit by default, protein meters and the Weedseeker are money in the hand straight away.

Looking into the future, one area that excites me is the potential for in-crop optical spot spraying, where the machine is able to identify weeds in-crop and spray them out, just like a Weedseeker does in our fallow phase at the moment. That would be a game-changer.

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Acknowledgements:

CONVERSATIONS WITH FARMERS