

FARMER PERSPECTIVES OF PRECISION AGRICULTURE IN WESTERN AUSTRALIA

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ABSTRACT

Many farmers in the WA wheatbelt have successfully adopted guidance and yield mapping technologies. However they have so far avoided adopting variable rate technology (VRT). While agronomists and farmers can determine the limiting factors to production, whether it is soil fertility, pH, plant available water capacity (PAWC) or others, they have less confidence in managing spatial variability.

Although WA farmers understand the need to adopt these techniques they have encountered major problems with a lack of compatibility between hardware and software, complexity of software packages, and poor technical support. A paper based questionnaire was circulated to growers in the WA. The survey along with case studies, first hand incidence of farmers, consultants and hardware suppliers add to the understanding of the problems faced by farmers in establishing a PA system beyond guidance and on to VRT. Cost is often explained at the major reason non-adaption but in WA it was a minor reason. The farming community strongly endorse the adoption of PA technology to manage variability within field. Nevertheless they have become frustrated with the technology and this has impeded uptake more than any other factor. This implies they are comfortable making the appropriate agronomic decisions given the data and will move forward when they get the systems up and running.

RESULTS

The results of the responses to the questionnaire are summarized in the following tables. Values are weighted averages of respondents answering “YES”.

Table 1. Does variability exist on your farm and what does it mean to you?

102 growers in total	South (45)	North (28)	Central (29)	Average
Does the yield vary in ANY field by more than 1 t/ha?	84%	89%	88%	87%
Do low yielding parts of your farm reducing profitability?	84%	96%	100%	92%
Could varying inputs make your program more profitable?	100%	100%	100%	100%

Variability is wide spread and most farmers manage individual fields differently (Table 1). Thus variability is already managed at the field level. However the majority of farmers are interested in varying inputs within a field with the belief that this will increase their profitability.

Most farmers believe they know if and where they have a yield limiting problem simply by observation. One grower indicated that he could see this variability most when spraying and that was confident in drawing “mud maps” of yield variation in his fields. Yield mapping is being carried out by most farmers, but the maps are often stored for years without being used. Farmer observations and yield maps should be used together to develop a soil sampling protocol to test the zones within fields. The combination of years of observation, yield maps and strategic soil sampling are part of developing a VRT program.

Developing VRT zones within a field depends on the level and cause of the variability. Differences in the ability of soils to hold water (Plant Available Water Capacity - PAWC) account for much of the yield variability in WA agriculture. Changes in soil types within a field can be observed by farmers, backed up by yield maps, soil testing and surveys. All of these data layers are used to develop zones within a field and can be used to produce prescription maps.

Table 2. Problems for Growers (What is holding them back in adopting PA?)

	South	North	Central	Average
Software & machine	38%	27%	50%	38%
Data interpretation	33%	39%	26%	33%
Cost	13%	7%	13%	11%
Time	4%	9%	13%	8%
Not yet convinced	4%	9%	-	4%
Reliability	-	4%	-	1%

The major impediments to the adoption of precision agriculture are the problems of hardware interactions and complexity of software. In our case studies we have numerous stories of lack of support for new equipment, lack of understanding from machine dealerships on the capabilities of systems and a general attitude of “we sell the machines, it is up to you to make them work”. There are always exceptions to this. Only 4% of those surveyed were not convinced that the system would not be beneficial and make their farm more profitable.

CONCLUSION

The farming community strongly endorse the adoption of precision agriculture technology to manage variability within fields. Nevertheless they have become frustrated with the technology and this has impeded uptake more than any other

factor. This implies they are comfortable making the appropriate agronomic decisions given the data and will move forward when they get the systems up and running.