



Precision Agriculture - Lessons from the Past and Pointers for the Future

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Precision Agriculture (PA) can be regarded as a means of increasing the chance that the right crop management strategies are implemented in the right place at the right time.

Numerous examples exist of the successful application of PA to the production of various crops around the world including wheat, corn (maize), soybeans, potatoes, sugar beet, barley, sorghum, cotton, oats, rice, wine and juice grapes, citrus, bananas, tea, date palms, tomatoes, apples, kiwifruit, sugarcane, olives and tobacco, and PA has even been used to assist in the management of sporting venues and railway lines. More often than not, this use of PA has been shown to be profitable. In spite of this, the rate of adoption by growers of many crops remains low (both the grains and wine industries in Australia are good examples) and, in some industries adoption has been negligible. An Australian example of the latter is the sugar industry - despite its relatively high rate of adoption of controlled traffic and the ready access that growers have to supporting infrastructure such as local GPS base stations. One reason for this low rate of adoption is the lack of an informed basis from which to make decisions as to appropriate investment in PA – whether these be in terms of pragmatic application by growers, the level of involvement (if any) by processors, or with respect to research to facilitate such adoption. ‘Will this work on my farm?’ is a key question which many are uncertain about.

A part of acquiring an informed view of PA is to look at its application in other cropping systems. This is also a worthwhile activity for an organisation such as SPAA as it seeks to maximise the value that it can provide to its members, especially with respect to ensuring that individual growers and industries can learn and benefit from the actions of others. It is also valuable as an aid to identifying areas of hitherto untapped opportunity.

This talk, which derives from a more extensive review^A, will draw on PA research and application in a range of cropping systems from around the world and considers the key drivers of variability in these production systems. Constraints to the adoption of PA and its likely economic benefits are also considered. An important conclusion is that whilst the primary opportunity for PA in broadacre systems (eg wheat) may be to use it to target the management of inputs to production, whereas in more intensive higher value systems (eg winegrapes) it is to selectively harvest into different parcels according to the intended end use or market opportunity, there is good reason to suppose that the benefits being chased by winemakers are also available to maltsters, pasta makers and flour millers. Equally, benefits being sought by wheat farmers are also available to growers of winegrapes or vegetables, etc... Thus, PA should be considered as a tool for optimising management of the whole value chain. It can also play a useful role in natural resource management and the minimisation of the environmental impacts of agriculture.

In addition to R+D to support the broader implementation of PA outlined above, opportunities also exist for developing new sensors in support of soil management and the management of crop quality. We also need to recognise that in addition to inferring management that is ‘site-specific’, PA requires that interpretation of some of our commonly used agronomic tools (soil tests are a good example) also needs to be site specific. We must therefore be willing to challenge and recognise the limitations of existing agronomic norms, and recognise that experimentation is a key farm business management tool and not just something done by researchers.

^The original review was published as:

Bramley, R.G.V. 2007. Precision Agriculture: An avenue for profitable innovation in the Australian sugar industry, or technology we can do without ? In: Bruce, R. (Ed) Precision agriculture options for the Australian Sugarcane Industry. SRDC Technical Report 3/2007. Sugar Research and Development Corporation, Brisbane. pp. 5-59.

A revised and updated version will be published during the next few week as:

Bramley, R.G.V. 2009. Lessons from nearly 20 years of Precision Agriculture research, development and adoption as a guide to its appropriate application. *Crop and Pasture Science* **60** (3), in press.