

Increasing Profitability Using PA A WA Perspective

Phil Longmire, N. Sc., Beaumont, Western Australia
Email PBLong@bigpond.com Phone 08 9078 7054 Mobile: 0429 787 055

After completing my Nuffield Scholarship, it became apparent that the focus in Precision Agriculture has to remain on profit, first and foremost. The aim being in using the instruments of Precision Technology to assist in providing a more profitable solution rather than focusing on supplying a site specific answer. The ongoing development of new technologies will continue to improve the accuracy of these solutions. These technologies must provide a greater return than the ensuing investment & be readily adaptable with no reduction in the efficiency of current operations.

The aim of our operation is fertilise to 5% above the 5 year average. As data provides us with a better picture of where our stable higher & lower producing areas are, we might be able to manipulate this accordingly. An issue with the use of high analysis compound fertilisers as the varying product is all elements are reduced or increased inc. trace elements with VRT. Correcting one deficiency may require an under or oversupply of other nutrients which may make it cost prohibitive or be more detrimental in the longer term in our relatively late developed farming area in Western Australia. In South Africa it was common to see high level VRT pre & post seeding with seeding kept a simple process using casual labour. We have adopted this policy in the majority using autosteer with auto on & off end turns to get our crop in the ground as accurately and efficiently as possible. Timeliness is critical and mustn't be compromised.

Lateral Accuracy

With the development of autosteer & tramlining, our VRT systems can only be varied in the direction of travel. An important part of this is achieving an accurate application laterally across the system. An integral part of & often neglected area is residue management. Opticrop, a high yielding crop management consultant in North Dakota require their growers to fit an appropriate spreader to achieve even residue spread. This is increasingly challenging as harvest equipment gets wider and in our continuously windy conditions. Adding a liquid cart fitted with a dosatron to our seeding equipment gives us an equal and even spread of nitrogen banded under each seeding row as well as enabling us to add fungicides & trace elements. We imported dribble bars from the US to fit our boomspray which gave us an accurate application rate both across and with the direction of travel while being a flexible system for VRT application of N.

“If you don't measure it, you can't manage it”

The importance of recording as many data layers over a period of time will allow stable analysis. Successful examples in the Southern capes of South Africa were a partial shift in Nitrogen to the South Facing Slopes resulted in significant yield increases after the pattern was discovered through analysis. Omnia fertilisers provide a complete VRT liquid application based on their soil testing and analysis. P&K were applied simultaneously of rates up to 700 litres/ha of K on a property of 14000ha that had been soil sampled to 4ha grids. This was a fully charged service that required a yield increase greater than the associated costs. The value of data recording & management was a much greater focus in the high yielding areas around the world compared to Australia who have the largest adoption of autosteer & guidance which reflects our assessment of profitable efficiency gains.

Simplest & most profitable gain

After fitting GPS & guidance to our machinery we were able to record topography. This was overlaid on biomass data and it was noticeable that the low areas and adjacent slopes were suffering waterlogging and subsequent yield loss. This data was processed giving us water flow patterns and drainage lines. Using our carry grader & a laser unit, drains were cut to shift excess water to deeper lakes. This has removed a large amount of surface water and increased yield in the adjacent areas.

Natural PA

A paddock of continuous cropping on variable soil types was improving yield in certain areas but falling in the poorer soil types with an increase in hard to manage weeds in these areas. After sowing a "shotgun mix" of five pasture varieties suited to the varying soil types, resulted in differing compositions but a successful pasture establishment across the paddock. This is reflecting in improved organic matter & soil nitrogen levels across all areas. Using this as a basis for VRT pasture management we fitted a second spreader unit to our super spreader this year. The aim is to spread a pea/vetch mix on the grey sodic clay areas using EM, crop circle biomass & yield data to map the zones, while applying a mix of pasture species and superphos in the main unit. The above data will be the basis for VRT gypsum application in the following season on the same areas. Hopefully this will provide an increase in organic matter and an improvement in soil structure on the harder to manage soil types before entering a cereal cropping phase.

VRT Mn & N using Crop Circle Biomass Sensors

After trialling greenseeker mapping in 2006 we found after tissue testing that lower biomass areas of our paddocks were suffering Mn deficiency early in Plant growth(not visible by eye). This was the decision to purchase biomass sensors and a second spray tank which enables us to apply high rates of Liquid Mn to lower biomass areas while applying an in crop broadleaf spray through the main tank. This was achievable by having dual lines, using the rear line for Mn. This gives an instantaneous response to switching making the application "point ready", a limitation of injection systems which create time lags and uneven mixing across the boom during this lag. An important consideration when we purchased the equipment was not only the initial cost but uses if it did not achieve our aims. The system will give us continuous in time biomass maps throughout the growing season & the second tank increases our spray capacity when not being utilised for VRT. We will test the system in applying extra N while applying fungicides to low and high biomass areas.

Weedseeker

A weedseeker unit fitted by a farmer contractor has provided considerable cost savings during our summer spraying period. This equated to a reduction in chemical use to 14% of the total area at double the applied rate. In the face of rising chemical costs, it will be a useful tool in certain situations.

The ability to have collected data processed and output application maps supplied by independent PA service providers should help in making new technologies become mainstream and more readily adaptable. This with a movement towards a common platform will remove the frustrations experienced by ourselves and others as we push to use the benefits of PA to increase our profitability.