

Project No.: PA 1/04
Project Title: Increasing economic returns with precision agriculture in SA.
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Executive Summary

In this second phase of SAGIT funding SPAA has continued to promote and support the uptake of PA technologies to improve the economic returns to growers. SPAA has convened PA expos, conferences and training workshops for growers, advisers and the commercial PA industry. SPAA has also provided high quality and independent information on PA systems through newsletters and magazines.

Results of research trials in a range of cropping environments across SA over several years have demonstrated the value of zoning to assist with the identification of yield limiting factors and to manage these limitations for a better economic return. In this project the research paddocks were zoned according to variations in grain yield, EM conductivity and elevation. This zoning was then used to target soil sampling sites and for the location of on-farm trials to assess treatments to improve economic returns. Key factors limiting grain yields at these sites were plant available water holding capacity (particularly clay content and soil depth) and subsoil constraints (especially boron and sodicity).

A key finding of these trials is that in some zones within paddocks where soil phosphorus levels are high phosphorus fertiliser rates can be reduced without reducing grain yields. These higher soil P levels are the result of many years of lower crop yields and, therefore, less crop removal, but with an even application of fertiliser. Results of on-farm trials showed that grain yields did not increase in zones where phosphorus was added if soil P levels were already high. In fact, in some years adding any P fertiliser to these zones reduced grain yields.

Another key finding was the use of EM mapping to define areas responsive to deep ripping. In a trial at Buckleboo wheat yields increased where the soil was deep ripped in the lower EM (lighter soil) areas but not in the higher EM (heavier soil) areas. Deep ripping is an expensive operation and therefore this finding will assist growers to identify areas where economic responses to deep ripping are likely to be worthwhile. There was no grain yield response to the deep placement of fertiliser in either soil type at this site.

A whole farm economic analysis of the value of PA on the five cooperating farms showed an average annual return of \$18/ha each year from the use of guidance and variable rate inputs. These economic returns, together with on-going support to growers, advisers and the industry will continue to increase the uptake of PA further. Every additional 5% of the cropped area in SA managed with these technologies is expected to increase returns to growers by an estimated \$2.7m/year.