Improved decision making for the treatment of acid soils in South Australia

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Soil acidification affects more than two million hectares of agricultural land in South Australia and is a major threat to soil health and crop and pasture production. Due to greater cropping intensity, removal of high crop and hay yields and increased use of nitrogen fertilisers, research has shown that the amount of lime required to offset the annual acidification rate is on average about 250 kg/lime/ha/year. Acidification of the sub-surface (10-20 cm) soil layers is also increasing.

Previously, the amount of lime required for a paddock was calculated on a single soil test with the lime applied at a uniform rate across the whole paddock. Sometimes a grid sampling system has been used but this is time consuming and expensive. In recent years, the cost of lime and associated freight to the farm has increased.

A new and innovative approach to pH sampling is the use of a Veris on-the-go soil pH machine that can test and geo-reference approximately 10-12 samples per hectare. From this information the spatial variability of soil pH across paddocks can be mapped and pH zones identified. The zones show where and at what rate of lime should be applied. Field testing has shown a high correlation between the Veris machine and laboratory results. Cost savings by applying lime to the zones rather than a uniform rate can be in the order of 30% or more.

Decision support tools have been developed to assist farmers to make better decisions when treating soil acidification. These include: a lime requirement recommendation for each soil pH zone and; a cost comparison of liming products taking into account the lime quality, freight and spreading costs.

The pH mapping technology and the decision support tools assist to deliver more cost-effective solutions leading to greater farm uptake and management of soil acidity.