

Soil pH Summary

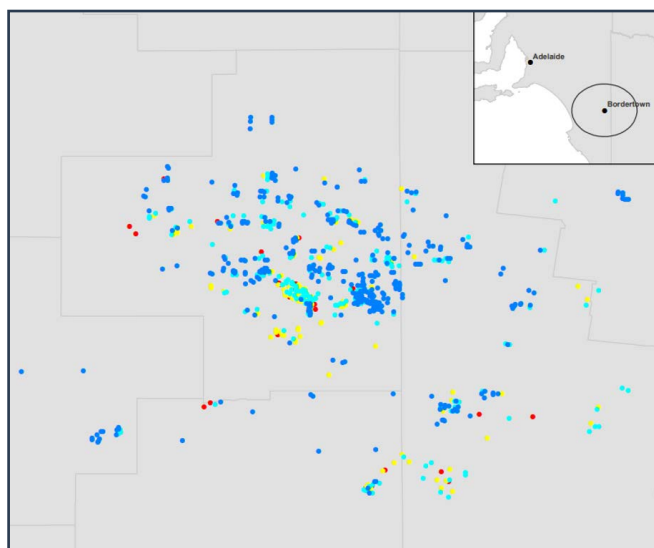
Bordertown Regional Insights



Soil pH is a significant constraint to agricultural production across Australia. Soil pH directly affects the concentration of major nutrients and the forms of microelements available for plant uptake and can result in deficiencies or toxicities.

To increase soil pH is relatively easy, and usually achieved through the application of agricultural lime, with intensive pH mapping allowing the quantity applied to be varied across the paddock based on the requirements.

Soil data from 619 paddocks sampled in the Bordertown region of SA can provide valuable insights into the extent of soil acidity and variability seen at the sub-paddock scale. Across the entire dataset, the average paddock scale pH was 5.7, ranging from 3.9 to 8.2. Figure 1. shows the spatial distribution of paddock average pH.



pH (CaC12) 0-10cm

- Below 4.49 ● 4.50 - 4.79 ● 4.80 - 5.19
- 5.20 - 5.79 ● Above 5.80

Figure 1. Map of paddock average pH of grid soil sampling from 2018-2022 in the Bordertown region.

Within any individual paddock, pH varied on average by 0.2 pH units but by as much as 3.7 units in one paddock. This within paddock variation is higher than Precision Agriculture has seen in other regions where the average range in pH is around 1.2 units within a paddock.

Figure 2. Shows the pH data for the individual paddocks. The orange line is the minimum pH to average, and the green line is the average to maximum pH for each paddock. The yellow line highlights the point of 5.5pH, which is the ideal pH target for cropping or pasture enterprises. Just over a third (34%) of the dataset has an average pH less than 5.5. Furthermore, 76% of the paddocks tested had a minimum pH below 5.5.

Soil pH - Bordertown Region

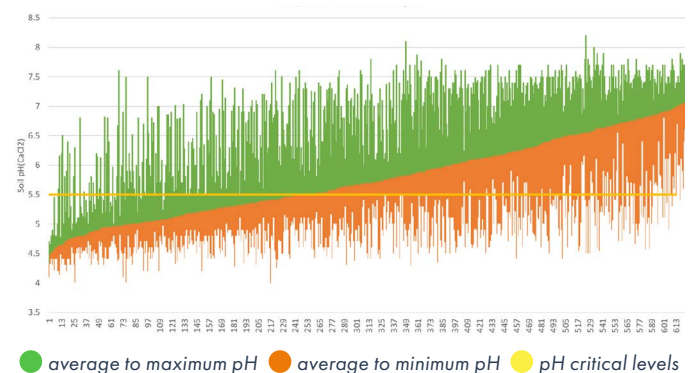
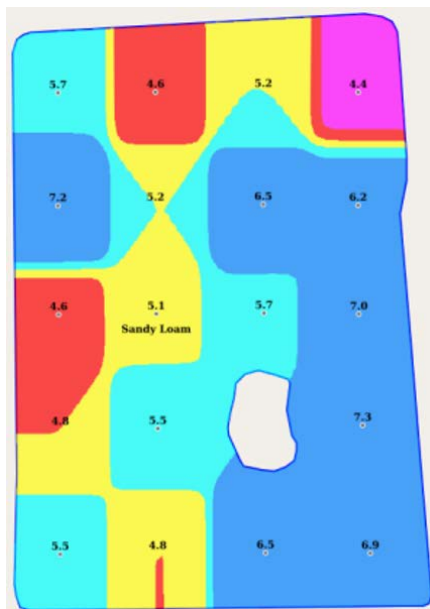


Figure 2. The yellow line marks 5.5pH across the 619 paddocks, indicating that 34.3% of paddocks tested had an average pH below the optimum 5.5pH.

WHAT DOES AN AVERAGE Paddock LOOK LIKE:

These results may be best understood through a pH map of an individual paddock. This paddock (Figure 3.) was tested in 2021 with an average pH of 5.7 (ranging from 4.4-7.3). This level of variation was typical across the region.

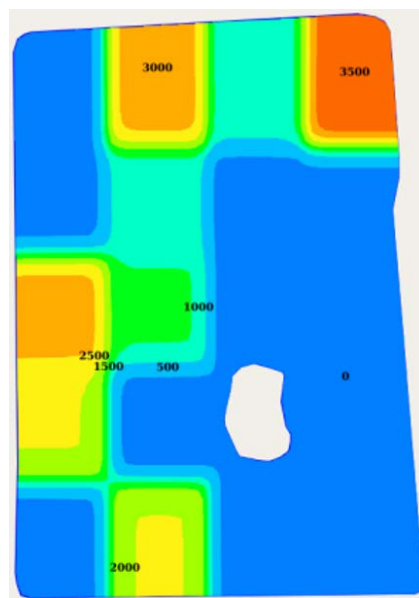


■ Above 5.8 pH ■ 5.2 - 5.79 pH ■ 4.8 - 5.19 pH
 ■ 4.5 - 4.79 pH ■ Below 4.49 pH

Figure 3. Individual Paddock in the Bordertown Region tested in 2021, the average pH was 5.7 with 35.9% of the paddock with a pH below 5.2.

While the paddock average has remained above the 5.5pH critical level, it is important to recognise that over a third of the paddock was handicapped with a pH of 5.2 and below. This reinforces the importance of variable rate technologies to begin to unlock the full productivity potential of these paddocks.

To reduce the variability of the paddock and increase the yield potential in the low pH areas, this paddock required an average rate of 904 kg/ha of lime to be applied to a total of 35.2 Tons. This will raise the pH to 5.5 in those poorer areas, without impacting the areas of the paddock that already had a satisfactory pH level (5.5pH and above).



■ 3500 kg/ha ■ 3000 kg/ha ■ 2500 kg/ha ■ 2000 kg/ha
 ■ 1500 kg/ha ■ 1000 kg/ha ■ 500 kg/hg ■ 0 kg/ha

Figure 4. LIME application map - Target 5.5 pH. Average rate applied - 904 kg/ha. Total Lime used - 35.2T over 38.9 ha.

