

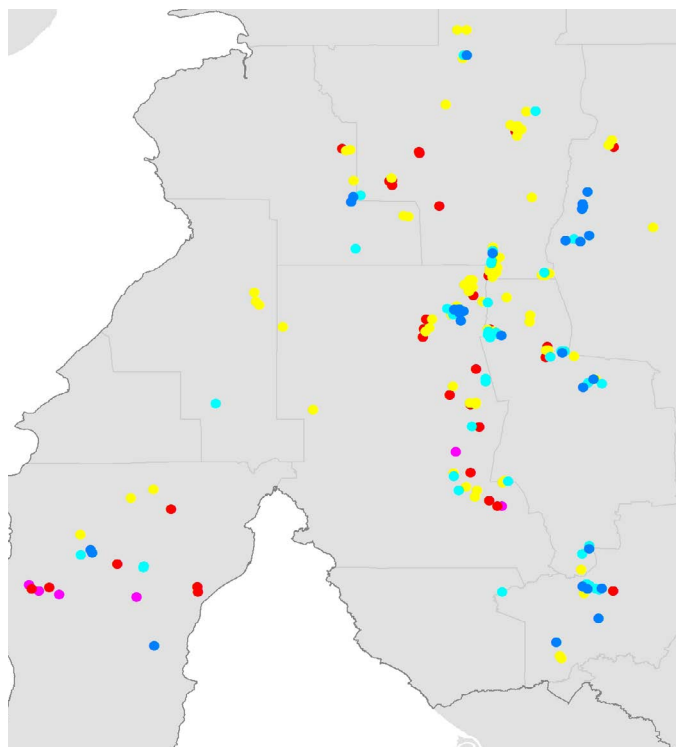
Colwell Phosphorus Summary

Mid North and Yorke SA Regional Insights



Phosphorus is an essential nutrient for plant growth. It has a key role in building plant structure compounds and as a catalyst in numerous key biochemical reactions in plants, such as photosynthesis. Phosphorus is critical for the overall health and vigor of all plants.

Across the breadth of the Mid North and Yorke region Cowell P data from 200 paddocks can provide valuable insights into soil P levels and the variability seen at the sub-paddock scale. Across the entire dataset, the average paddock scale Cowell P was 52 mg/kg, ranging from 18 to 155 mg/kg. Figure 1 shows the spatial distribution of paddock average Colwell P. While the critical Colwell P levels will vary significantly due to the soils Phosphorus Buffering Index and crop type we can use an indicative critical value of 35 mg/kg to aid in the interpretation of the data. In this region 20% of paddocks had an average Colwell P of less than 35 mg/kg.



■ Below 23.9 mg/kg ■ 24-34.9 mg/kg ■ 35-52.9 mg/kg
■ 53-70.9 mg/kg ■ Above 71 mg/kg

Figure 1. Average Cowell P data for the Mid North and Yorke region of SA (2018-2022) by individual paddocks.

More importantly, over 75% of paddocks had a minimum Colwell P of less than 35 mg/kg suggesting that at least some areas of the paddock are potentially P limited. Similar to other soil constituents Colwell P was highly variable within a paddock (Figure 2), with an average range of 69 mg/kg within a paddock (ranged from 10-172mg/kg). This variation suggests that there is significant potential for variable rate capital P applications to address soil constraints and optimise fertiliser use.

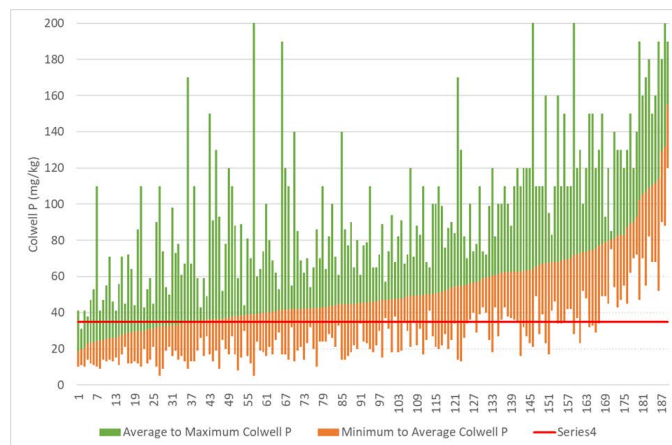
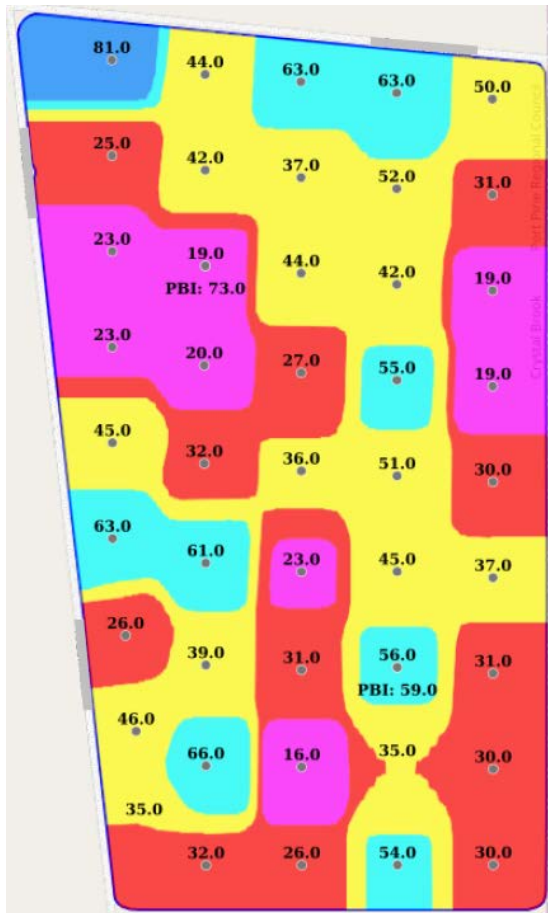


Figure 2. Soil Colwell P data for individual paddocks sorted by average Colwell P. The orange line is the average to minimum P values and the green line is the average to maximum Colwell P in individual paddocks. The red line represents a Colwell P value of 35 mg/kg.

WHAT DOES AN AVERAGE Paddock LOOK LIKE?

These results may be best understood through a Colwell P map of an individual paddock. This paddock (Figure 3.) was tested in 2021 with an average Colwell P of 39 mg/kg (ranging from 16-81 mg/kg).



■ Below 23.9 mg/kg
 ■ 24-34.9 mg/kg
 ■ 35-52.9 mg/kg
■ 53-70.9 mg/kg
 ■ Above 71 mg/kg

Figure 3. Soil nutrient map showing the Colwell P across a paddock. The average Colwell P was 39 mg/kg (ranging from 16-81 mg/kg).

Regular soil testing is critical for monitoring P levels to maintain critical P levels and to track that sufficient P is used to replenish the soil. This is particularly important when wheat can remove 3 kg/t, grass pasture can remove 3 kg/t of dry matter and milk production can remove 1 kg/t of liquid¹.

Knowing that the P capital is being continually mined, without a strategic P strategy to address constraints and replace the removed P, the soil will continue to degrade and productivity will drop.

¹(<https://www.soilquality.org.au/factsheets/phosphorus-tas>)

