



CASE STUDY

PICCADILLY

Property Profile

Name: James, Tim, Fiona & Chela Dempster

Annual Rainfall: 350 mm

Soil Types: Gravelly Sand & Sandplain

Enterprises: Broadacre cropping & Merino Sheep

Background

The Dempster family run a mixed farming operation located across South Mingeneu, Arrino and Eneabba. The operation consists of Merino sheep and a rotation of broadacre crops such as Lupins, Canola and Wheat.

'Piccadilly Farm' is situated south of the Mingeneu townsite. The farm is comprised of soil characteristics ranging from sand to loamy gravels.

The Dempster family took part in the National Landcare Program's Smart Farm Small Grants Soil Extension project through the Mingeneu - Irwin Group (MIG), where they focused on two of their properties, with their main concerns focusing on unproductive white sand, and shallow gravel.

By participating in this project, the Dempster's aimed to gain a deeper understanding of their soil and aimed to improve the condition of their soil.

Soil samples

MIG utilised the CSBP Decipher Ag NDVI system, through which they identified four focus sites across two paddocks. In both of the paddocks, two sites were identified, one that is a high production area, and one that was a low production area. The limitations that the soil possesses were subsequently determined by comparing these areas.

Various cores were taken at each site. Taken to a depth of 80 cm at Site 1 and Site 3, and to 60 cm at Site 2 and Site 4. These samples were tested using a fully comprehensive soil test in the top 10 cm, and a standard test to depth. These standard tests concentrated on pH, Nitrogen, Phosphorus, Potassium and Salinity.

In 2023, after the original soil samples were taken, the Dempster's applied lime and deep ripped Site 1 and Site 3, and all sites were sowed to wheat. After seeding, 40 L/ha of Flexi N, 100 kg/ha of NS6:1 and 40 kg/ha of MOP was applied across all sites.

Flexi-N is a Nitrogen liquid fertilisers whilst NS6:1 is a Nitrogen rich fertiliser with the addition of Sulphur. MOP is a Potassium rich fertiliser. The initial soil samples from 2023 indicated low levels of Potassium, Sulphur and Nitrogen, vindicating the Dempster's decision to use the above mentioned artificial fertilisers.



Results from the samples

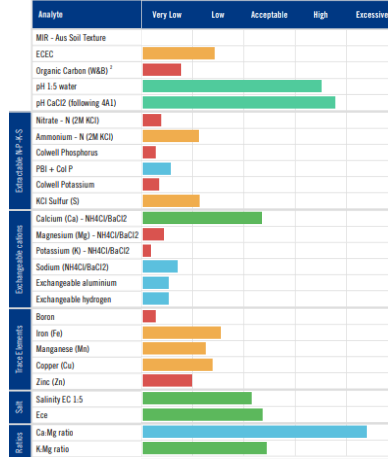
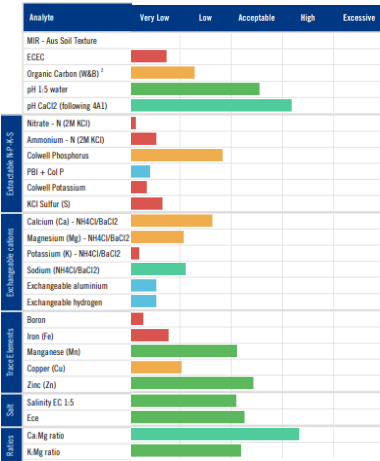


Figure 1 & 2: Results from Site 1, 2023 (left), compared 2024 (right)

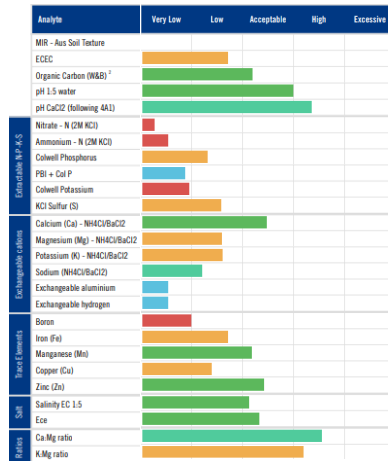
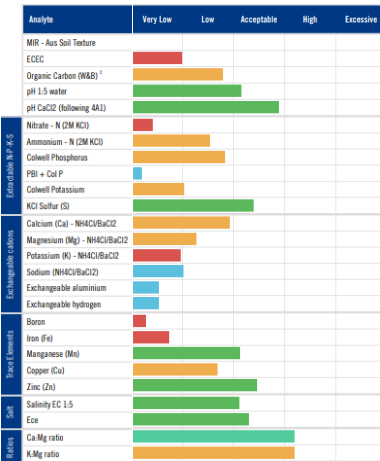


Figure 3 & 4: Results from Site 2, 2023 (left), compared 2024 (right)

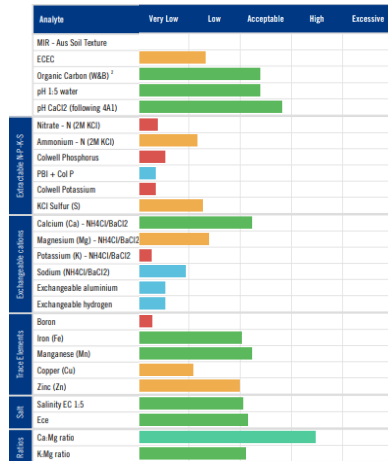
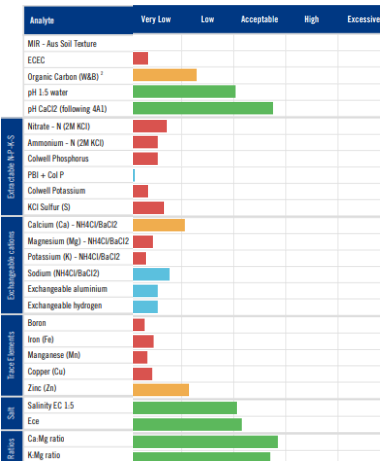


Figure 5 & 6: Results from Site 3, 2023 (left), compared 2024 (right)

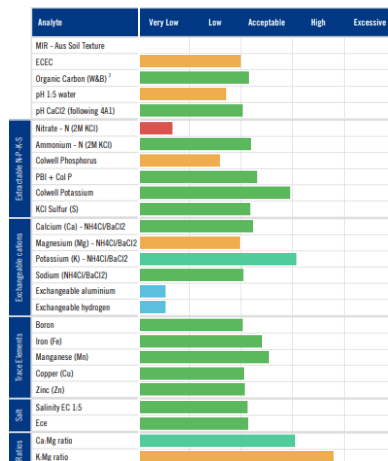
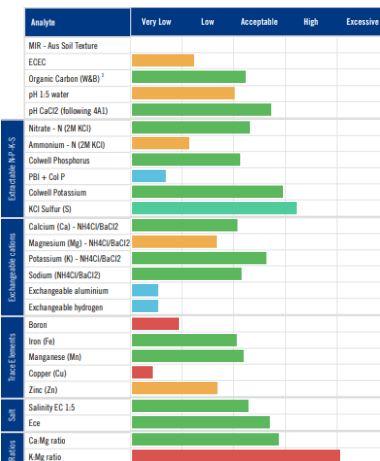


Figure 7 & 8: Results from Site 4, 2023 (left), compared 2024 (right)

The main constraints

Gravel soils that cannot be ameliorated are a major concern for the Dempster family. In the past, they have ameliorated the soil using a reefinator, as well as being a part of a Dynamite trial conducted by DPIRD. This was undertaken in an attempt to break up the hard layers of gravel that lay shallowly beneath the topsoil. They have also found that their soil is quite non-wetting where the gravel is present.

The Dempster's have also previously had issues with acidic soils. They have incorporated a liming program to amend this issue.

In 2023, the Dempster's applied lime to all of the sites, and this was followed by Deep Ripping. The soil sample results indicated that the lime application and ripping was successful in increasing the soils pH levels, not only at the surface level, but to depth.

The next chapter

In the future, the Dempster's will continue to soil sample and monitor their soils. They hope to undertake further soil testing to learn more about the Water Holding Capacity of their soil, and to determine how hydrophobic their soils are.

The Dempster's goal for the soil at Piccadilly Farm is to improve the production potential by removing as many constraints as possible. The soil testing through this project furthered the Dempster's understanding that perhaps they could push their soils further, and by applying higher rates of fertilisers could allow them to see the soils true potential.

When asked if he thought soil testing was important and if so, why, James replied: "Soil testing is important because you can identify any deficiencies and match your crop requirements with your nutrition program."



Australian Government

National Landcare Program

