24. Clay and Organic Matter Increases Yields on SE Sands

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Project Title: Increasing production on sandy soils in low and medium rainfall areas of the Southern Region

KEY MESSAGES

- Incorporating clay into the sand has led to yield increases that are improving with time.
- Yield response to clay application increased with the depth of incorporation; a cumulative increase of 0.74 t/ha (23%) over the control was achieved when clay was incorporated in the top 10 cm (Fig. 1 Shallow clay), increasing to 1.41 t/ha (44%) when the clay was incorporated to 30 cm (Fig. 1 Spading + clay).
- A similar response was achieved when 10 t/ha of Lucerne hay (organic matter (OM)) was spaded in, resulting in a 1.62 t/ha (50%) increase in yield (Fig. 1 Spading + OM).
- The combination of OM plus clay gave the best grain yield result in all years, with a cumulative 2.95 t/ha (92% increase) achieved across the 2014, 2015 and 2017 seasons (Fig. 1 Spading + Clay + OM).
- Spading alone led to cumulative decreases in yield of 0.39 t/ha (-12%), which is in contrast to results on Mallee sands, where the effect of spading has remained positive over time.
- Changes in soil chemical, hydrological, physical and biological characteristics as a result of clay and OM addition are the focus of 2018 soil measurements at the site.
- The response to deep disturbance and placement of OM and nutrition, in contrast to spading, is the focus of future research conducted by PIRSA at Murlong on the Eyre Peninsula in 2018.

Why was the trial undertaken?

The Cadgee site of the Sandy Soils project was established in 2014 as part of the South Australian State Government's New Horizons soil initiative. Its objective was to overcome the chemical, physical and biological constraints of sandy soils, with the aim of achieving long term crop productivity gains greater than 70%.

Similar trials were established on the Eyre Peninsula and in the Murray Mallee to determine which amelioration strategies are best suited to the sands in those regions. For more information: http://pir.sa.gov.au/major_programs/new_horizons/sandy_soils

How was the trial undertaken?

Soil amendments including clay, organic matter and fertiliser were applied to the soil either alone or in combination to assess their impact on crop production and soil fertility. Amendments were applied in 2014 and either incorporated shallow using a disc (10cm) or deep using a spader (30cm); they have not been reapplied. There are a total of 12 treatments, although only six key ones are reported here, replicated 5 times at the site, which is located 17 km north of Naracoorte.

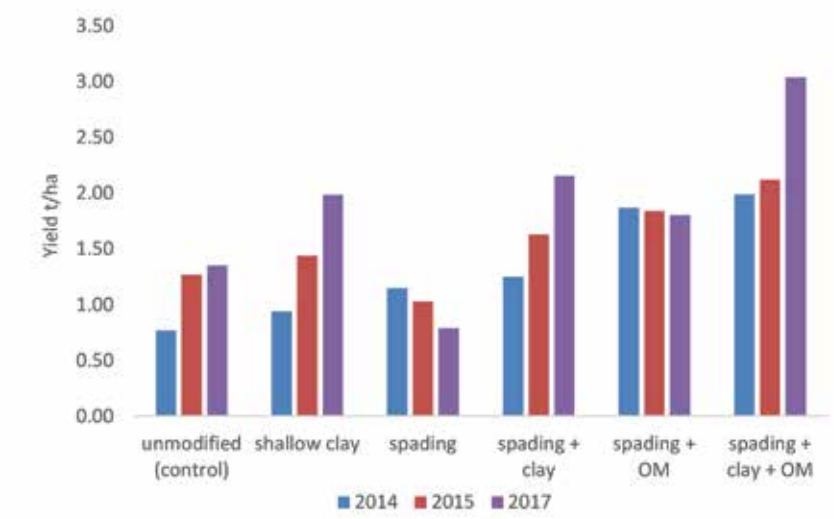

Figure 1: Grain yield of selected treatments at Cadgee in 2014 (wheat), 2015 (barley) and 2017 (lupins) for six of the key treatments at the site. The 2016 crop of canola was not harvested due to bird damage.

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