

Long term soil modification trials show benefits of clay

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Why was the trial/project done?

Soils in the SA Mallee are often sandy, low in nutrients, and water repellent, with clay under the sand. The clay may be shallow (20-40 cm) or deep (>50 cm). Adding clay to water repellent sand overcomes the water repellence, allowing better water infiltration and germination of crops or weeds. It also increases the nutrient holding capacity of the sand. However, modifying the soil with clay must be done properly or problems can arise.

How was the trial/project done?

Trials in the area around Karoonda looked at the effectiveness of delving and spading clay (Wood's, Loller's), and of spreading and spading clay at low, medium and high rates (Loller's, Pope's). The trials were set up in early 2010 and have been monitored for crop growth and yield every year since.

Key Messages

- Areas that were suitable for delving (shallow clay) have shown increased yields from delving, spading or delving and spading combined. However, delving and spading does not result in yields that are significantly better than spading alone. Spading has shown some advantages over delving in this trial; however each situation is different for each farm and soil.
- On the deeper sand, clay spreading from a nearby pit was used. The trial on Loller's property has shown that spading the soil (mixing it to a depth of 30cm) has a beneficial effect on crop yield, even when no clay was applied. This is probably because the spading has buried and mixed the water repellent topsoil, allowing the soil to wet up. Applying clay also increases yields, with the medium rate of clay (150 t/ha local clay @ 30% actual clay) showing the most consistent improvements in yields.
- The quality of the clay used in delving, spading or spreading is very important. The amount of actual clay present and the chemistry of the clay (pH, carbonates & toxic elements) will determine how successful the result will be.

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