6.7 BETTER SOIL STRUCTURE THROUGH CONTROLLED TRAFFIC CROPPING

Location: Willaura

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Background:
Raised Bed cropping has enabled high yielding crops to be grown in soils that were previously prone to waterlogging. However the adoption of raised bed cropping, with resultant improvements in crop health and yield, has not been as great in the Lake Bolac / Streatham district as in the non-traditional cropping areas of the south-west. This may be due in part to slightly better drained soils. However soil structural problems are common in this area and a system of Controlled Traffic may solve a lot of these problems.

Aim:
To demonstrate effectiveness of controlled traffic in the more traditional high rainfall cropping areas of Western Victoria.
To compare controlled traffic, raised beds and conventional flat cropping methods.

Methodology:
Sown on the 4th of June with Kellalac wheat at 110 kg/ha and MAP at 100 kg/ha using the landholder's conventional equipment. The four basic treatments were conventional (landholders standard sowing practise of direct drill), a raised bed treatment, controlled traffic and working the paddock twice before sowing. As well the first three treatments were duplicated with pig manure added as a high input treatment. The conventional plots were driven over randomly to distinguish them from the controlled traffic plots.

Each plot was 12 metres wide and 100 metres long. To enable basic statistical analysis to be performed every third plot was a control plot so that nearest neighbour analysis could be performed. It is planned to leave the plots in place for several years to monitor the changes in soil and crop health as well as yields in subsequent crops.

Annual Rainfall: 680 mm
Growing season rainfall (april-oct): 485mm

Conclusions:

Interestingly the highest yield was obtained where the standard conventional practice was used although it was not significantly different from the raised bed treatment. However both of these treatments were significantly higher yielding than the controlled traffic treatment and the double working treatment.

While there was some evidence of waterlogging late in the season, the site did not ever become totally waterlogged. Hence the raised beds did not out perform the conventional sowing plot. If a more waterlogging susceptible crop (eg. Canola) had been grown then the results may have been totally different.

The surprise however was that controlled traffic did not perform at all well this year. While it can take a number of years to see improvements in soil structure it was expected the yield would be at least comparable with the conventional plot. We believe that this yield depression may be due to the bad lodging that occurred due to unfavourable conditions over harvest. It had been noted that the lodging appeared to be worst in the controlled traffic plots and the raised bed plots. These plots may have grown excessively tall which would have made them more prone to damage at harvest.

Results:

Treatment	Yield (t/ha)	
	Normal Inputs	High Inputs
Conventional Practice	6.54	6.13
Raised Beds	6.44	5.12
Controlled Traffic	5.16	5.24
Double working before sowing	5.63	N.A.
Least significant difference (LSD 5%)		0.76 t/ha
Coefficient of Variation (C.V.)		4.1

The high input plots all generally yielded below their comparable normal input plot (in the case of the raised beds it was quite significant) and this may also be due to the higher inputs resulting in excessive growth making the crops more prone to lodging.

From these results it would appear that we have created more questions than we have answered. This trial will be re-sown this year (possibly to canola) and it will continue being monitored. Soil testing will continue this year to see what if any changed have occurred to the soil. It is also possible that crop height may need to be managed this year to minimise a repeat of the lodging problems