

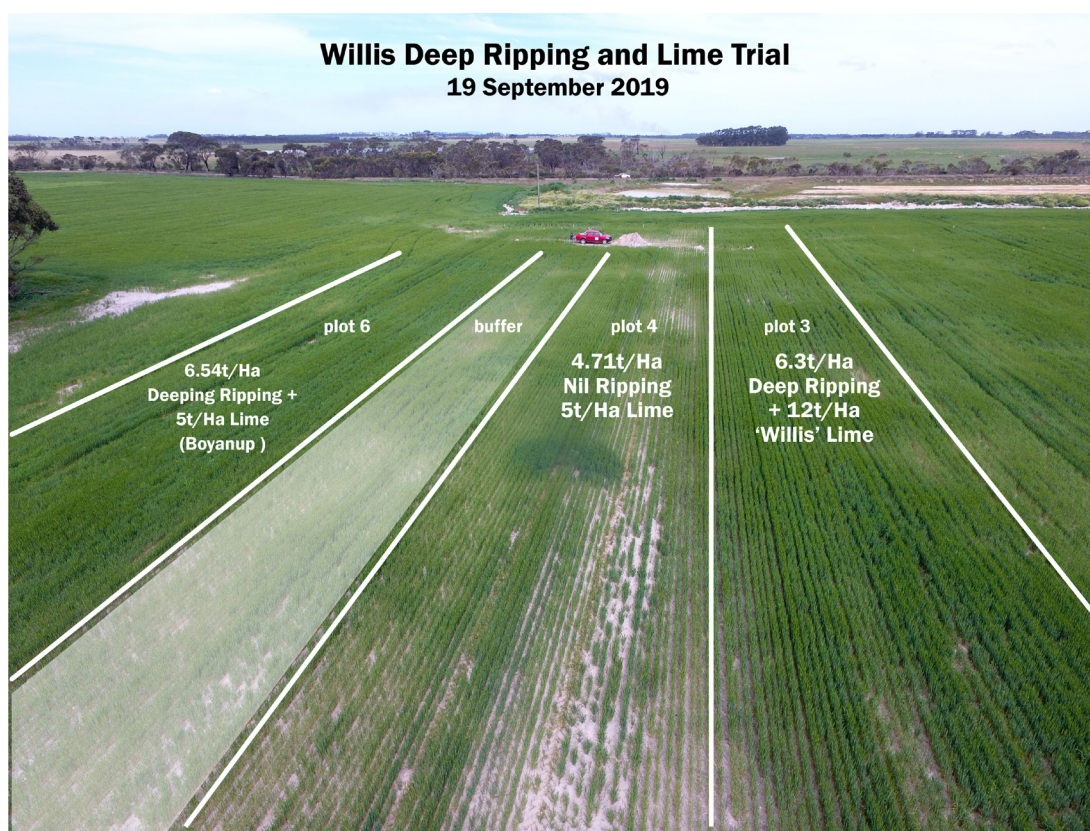


## BACKGROUND

This project aims to determine if deep ripping with inclusion plates after surface applied lime improves subsoil acidity (raises the pH) at a faster rate than surface applied lime applications only.

Inclusion plates are designed to allow for top-soil to relocate deeper into the soil profile down the back of the ripper tyne. If lime has been applied on the soil surface, then some of that lime should also move into the subsoil where it can react with acidity and increase soil pH. If subsoil acidity can be ameliorated faster than the traditional surface applications, then productivity gains through improved soil nutrient availability and soil biological interactions could occur sooner which will accelerate payback.

SCF researchers want to determine if subsoil compaction and acidity can be treated in the same pass of a ripping machine. The only extra cost of this strategy assuming the soil is compacted, is the wear on the inclusion plates and the extra drag created by them, increasing fuel costs, tractor hours and depreciation.



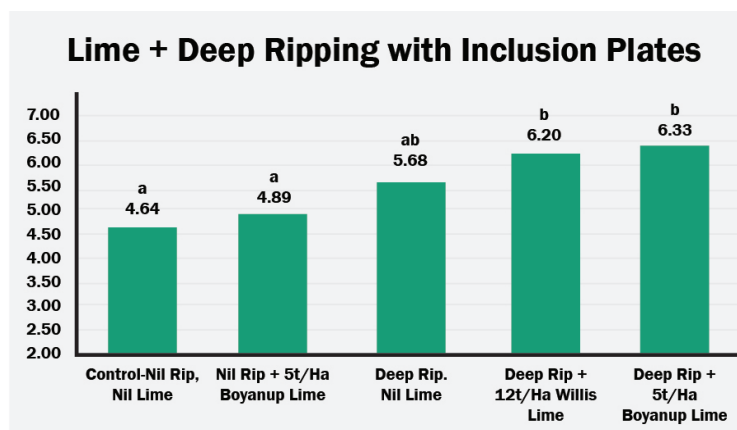
▲ Figure 1: Drone Image of the Willis lime by ripping trial at South Stirlings 2019. Crop biomass on the 19 September shows a distinct improvement over the unripped plots. Yield data collected at harvested correlates with this image.



▲ Figure 2: Image of a deep rip plus lime soil pit. The purple indicator shows lime has relocated down the ripper type in the subsoil.

## RESULTS

- Results show a clear response to deep ripping (60cm) in the first year with a 1.04t/ha difference between the deep ripping and control treatments.
- Nil ripping plus 5t/ha of Boyanup lime yielded 250kg/ha higher than the control (nil ripping & nil lime) but was not statistically significant.
- There appears to be an additive effect of ripping plus lime for both the Boyanup and the Farm sourced lime from Willis's property. An additional 520 and 650kg/ha of barley was achieved for the Willis and Boyanup lime respectively.
- The key questions remaining are 1) How long will the ripping benefits last? 2) How will the soil pH change, at 10cm increments, in subsequent years and 3) Will there be measurable difference in Willis lime (12t/Ha) and Boyanup Lime (5t/Ha)
- SCF will continue to monitor yields at this site in future years via yield data collected from the harvester.
- Soil pH data was benchmarked in March 2019 by a Joel Andrew from MapIQ. Each sample site was georeferenced and tested at 10cm increments down to 50cm. SCF will re-test the exact locations every few years to measure changes in sub-soil pH.
- A comparison of how quickly the lime ameliorates subsoil acidity will be made between surface applied lime and lime incorporated by deep ripping. Watch this space.



Note: Means followed by same letter or symbol do not significantly differ (P=0.05 LSP)

## ACKNOWLEDGEMENTS

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