

How often does soil amelioration pay the bills?

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CSIRO



DPIRD



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Primary Industries and
Regional Development

Liebe Group



West Midlands Group



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Background

- Subsoil amelioration is often expensive
- Crop responses are variable
- What are the chances...?



Understanding soil constraints

- Assess impact of amelioration on patterns of soil water use
- Use data to inform modelling
- Use long-term climate data to estimate probability of crop response.



A tale of two trials...

Liebe

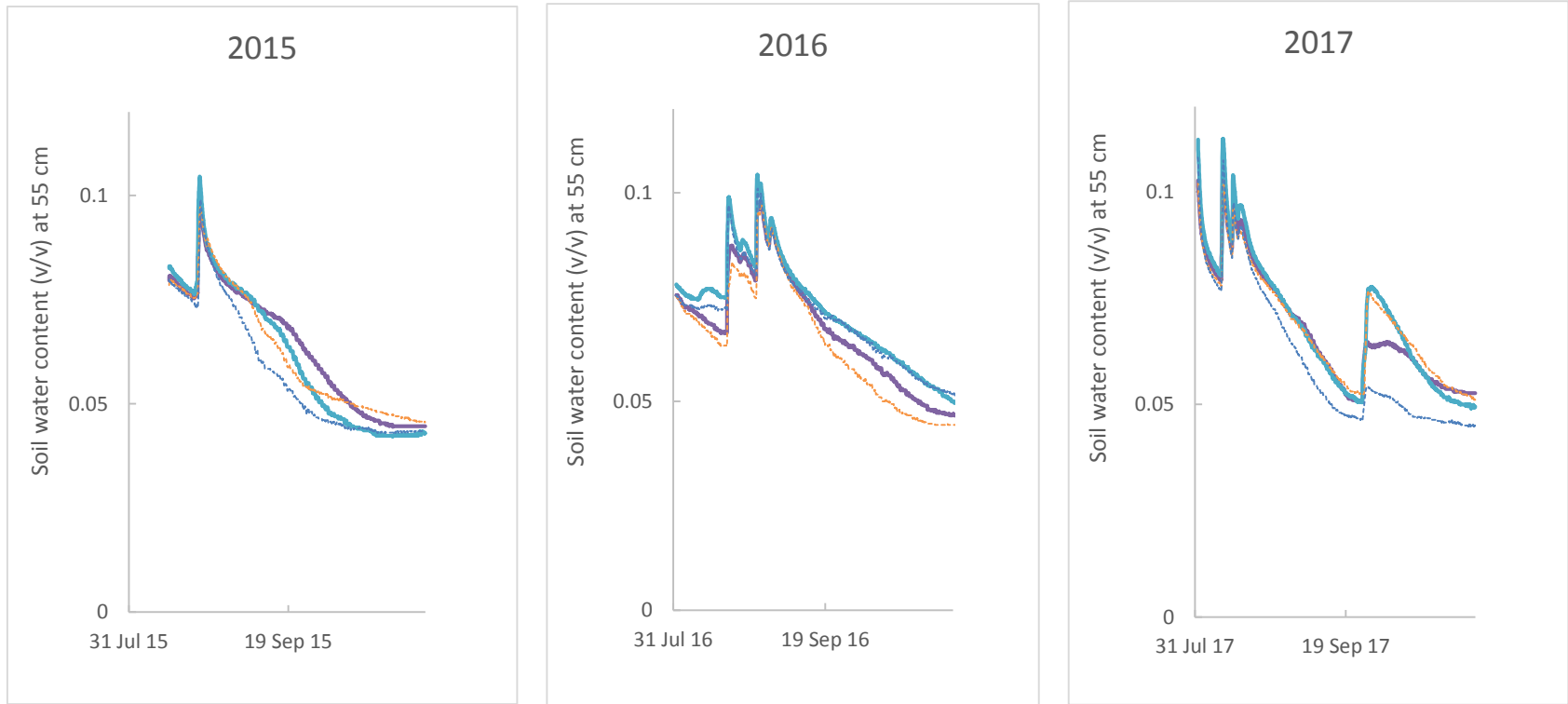
- Control (0 lime, no-till)
- Lime & dolomite
- Spade ~ 30 cm
- Spade + lime & dolomite

West Midlands

- Control (0 lime, no-till)
- Lime 5 t/ha
- Rip & spade, ~30 cm
- Lime + rip & spade



Patterns of soil water uptake at West Midlands



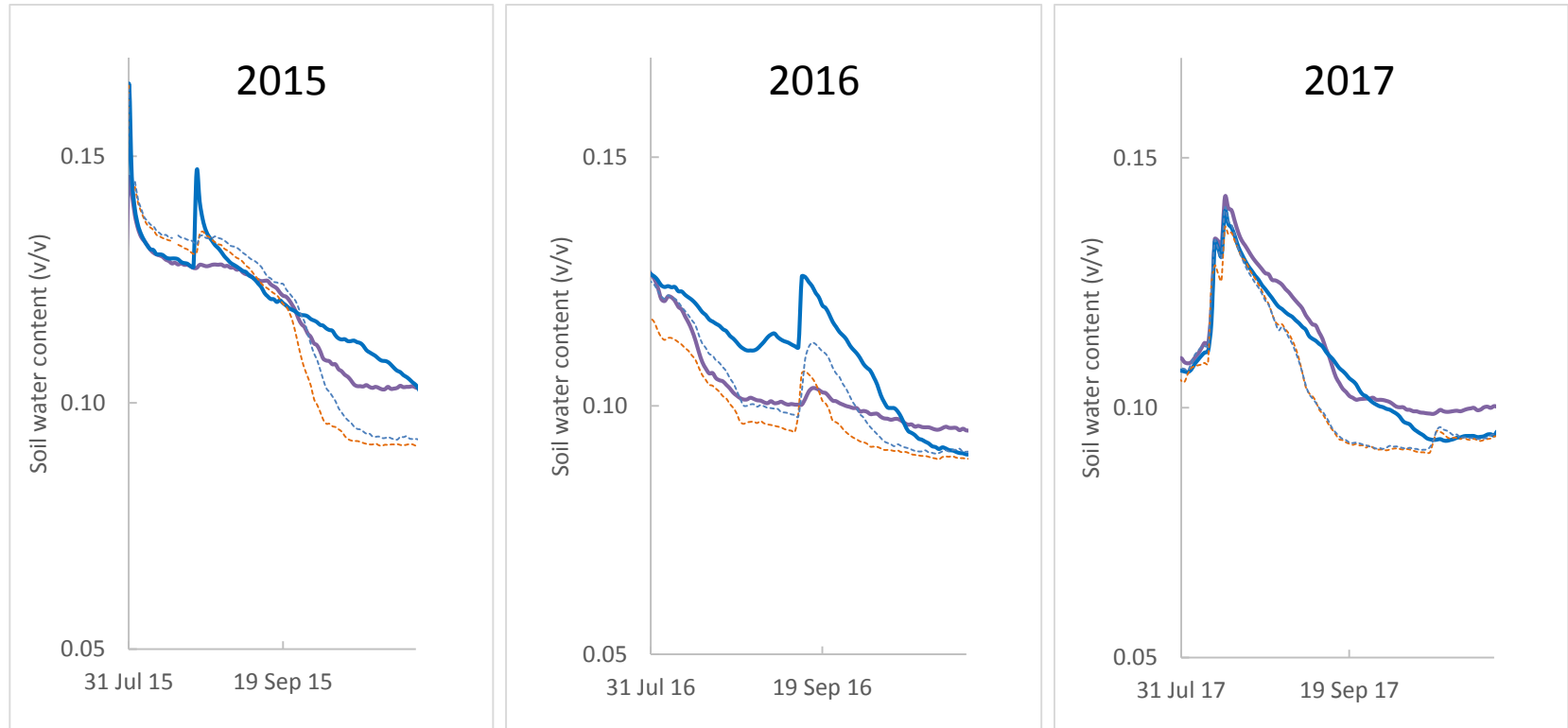
— Control, zero lime

— Control, 5 t/ha lime

- - - Rip+Spade, zero lime

... Rip+Spade, 5 t/ha lime

Patterns of soil water uptake at Liebe



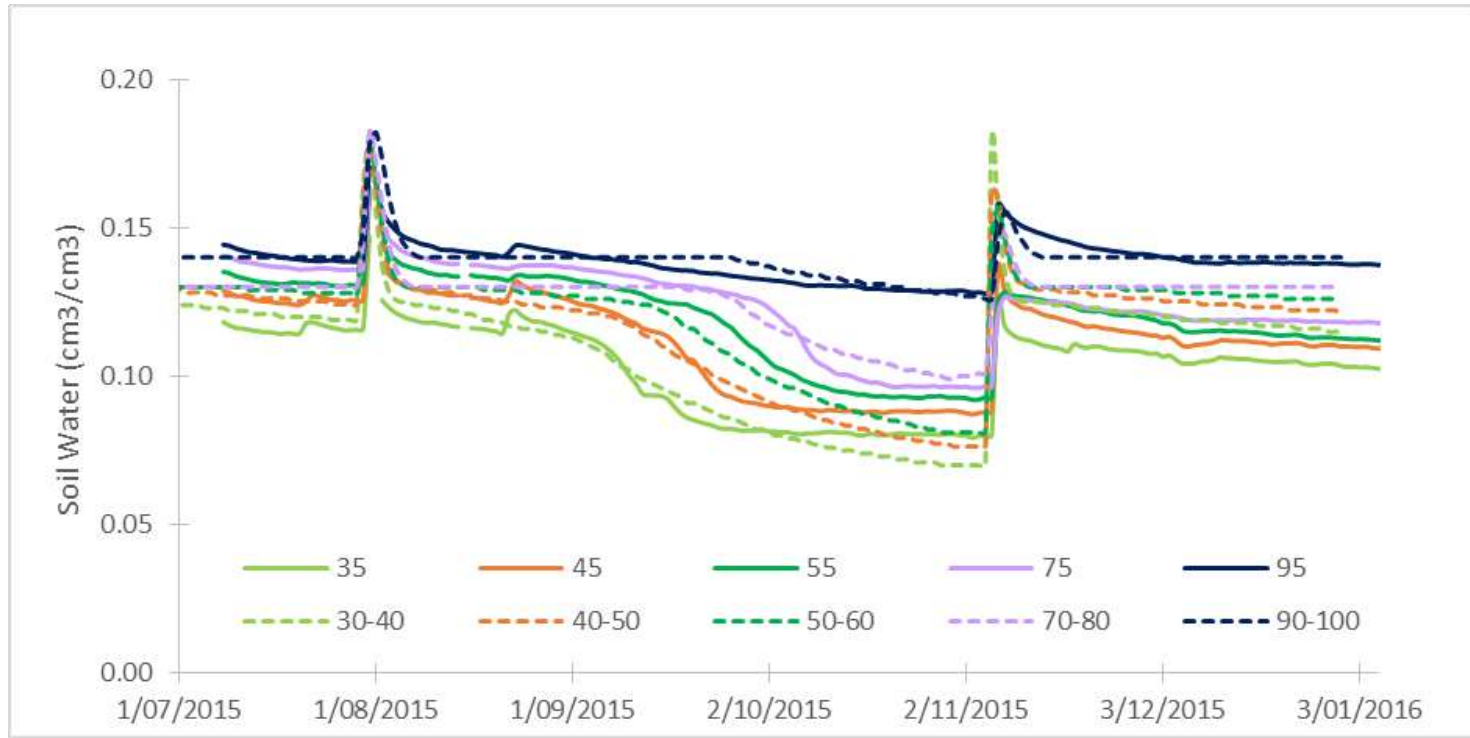
— Control, zero lime

— Control, lime

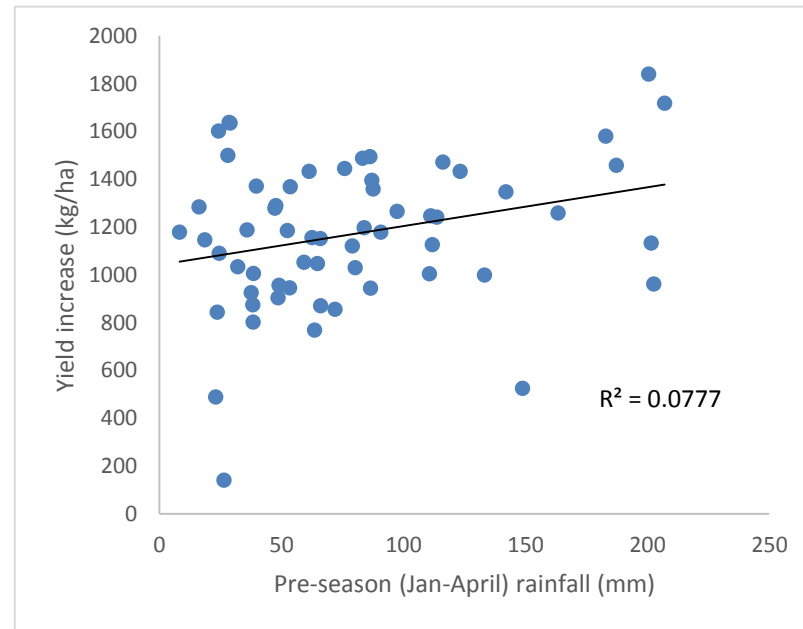
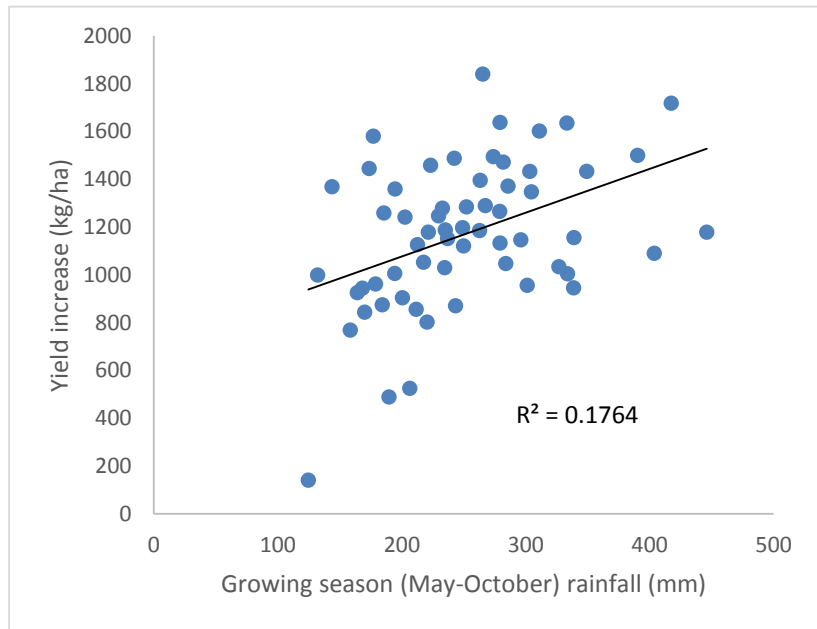
- - - Spaded, zero lime

- - - Spaded, lime

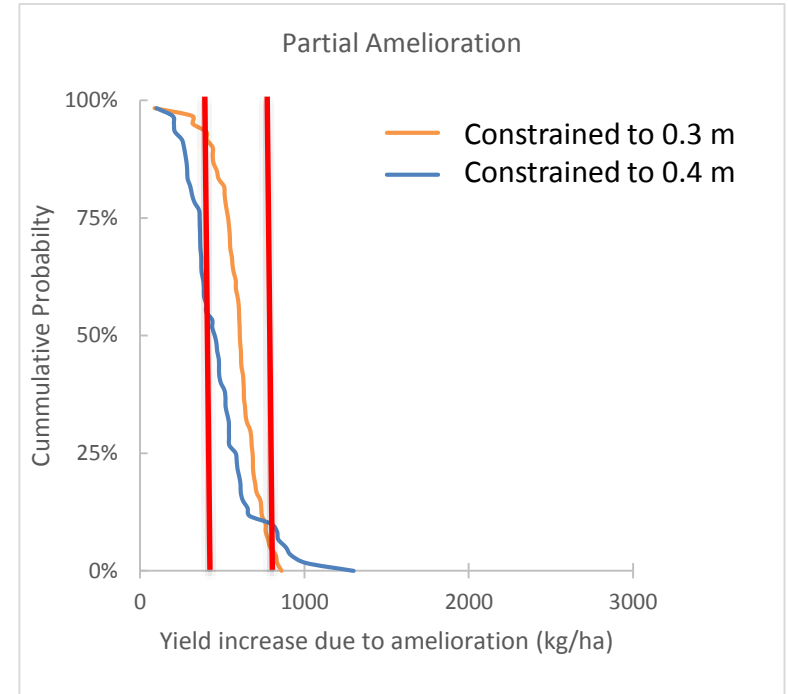
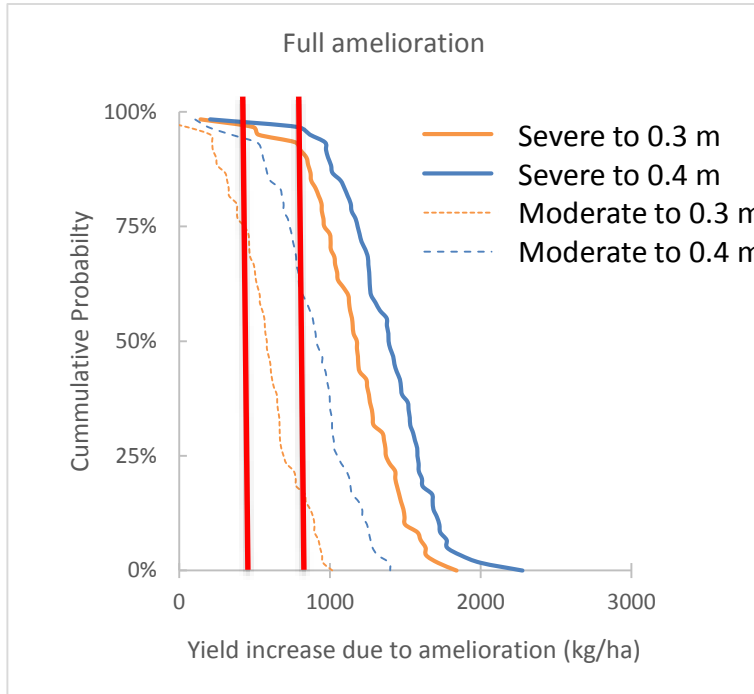
Model calibration example



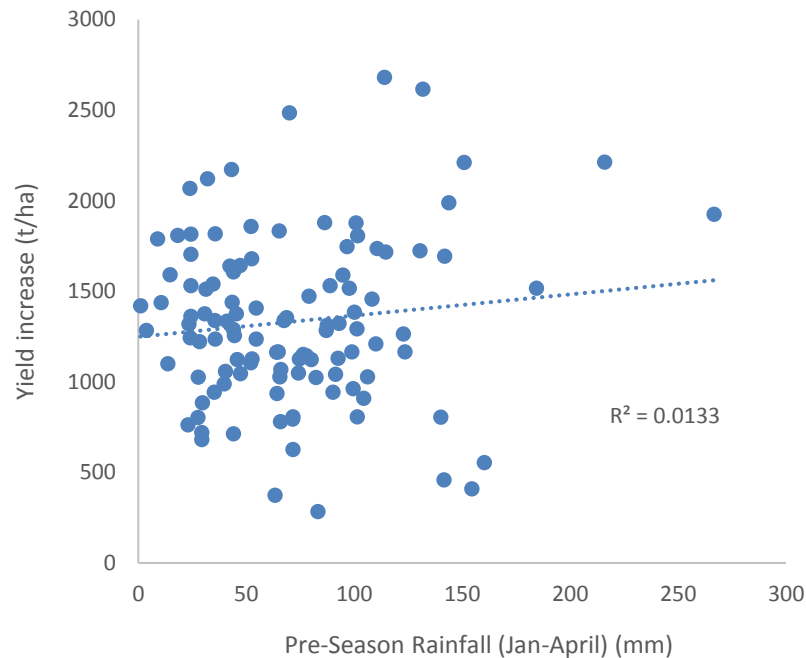
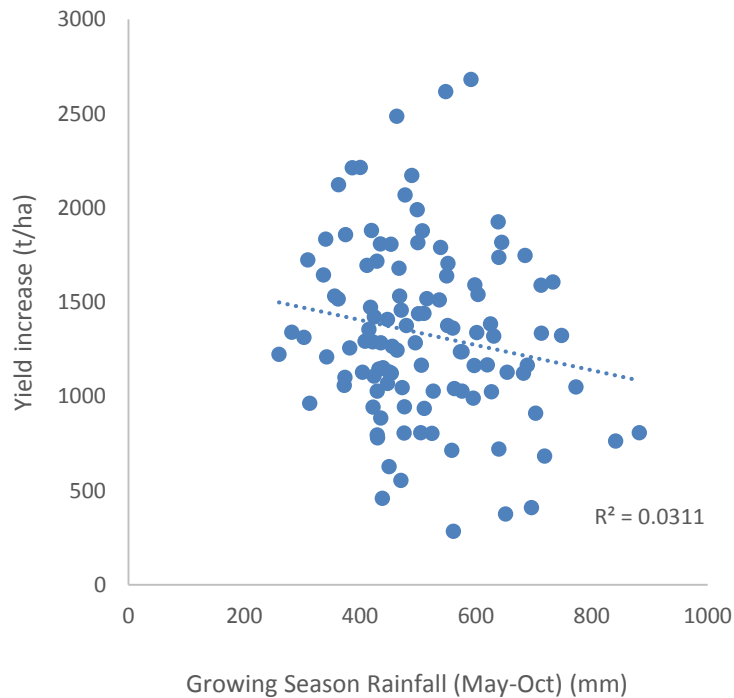
Long-term simulations – Dalwallinu



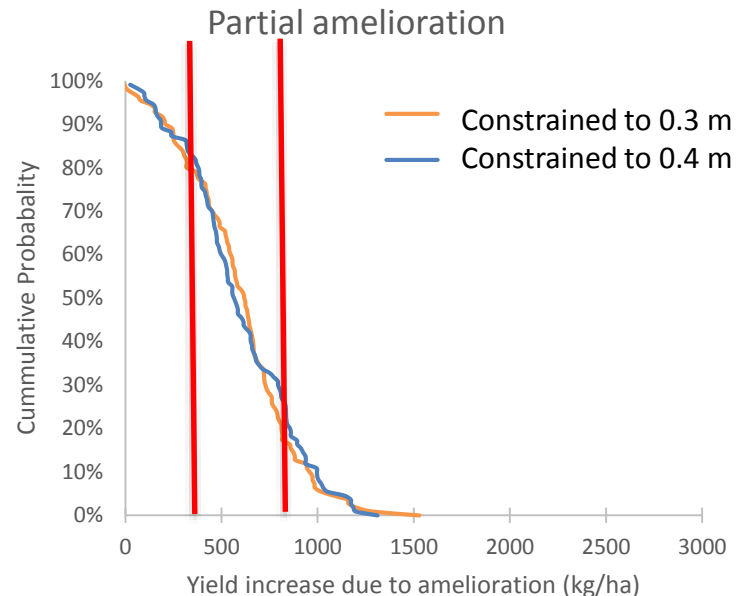
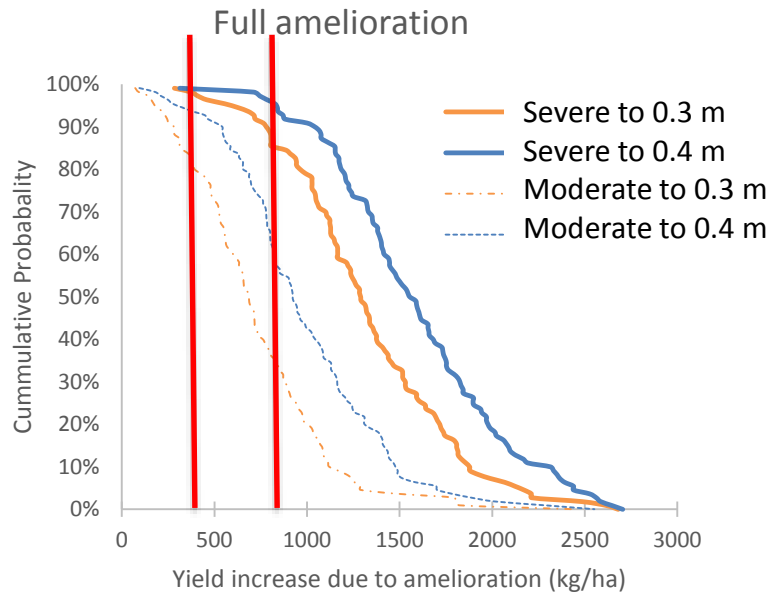
Long-term simulations – Dalwallinu



Long-term simulations - Yathroo

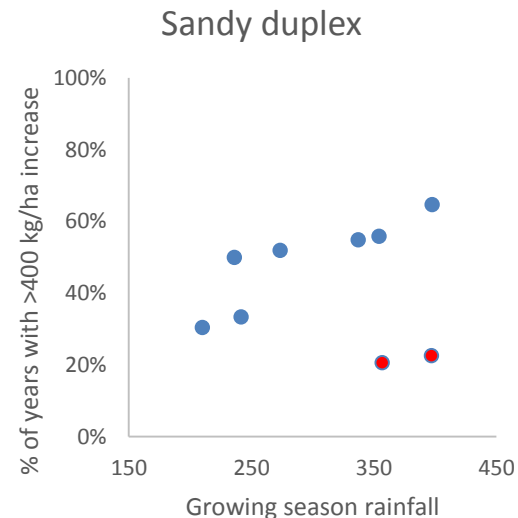
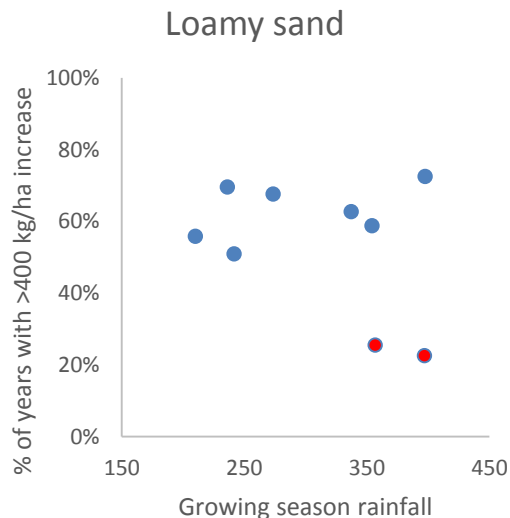
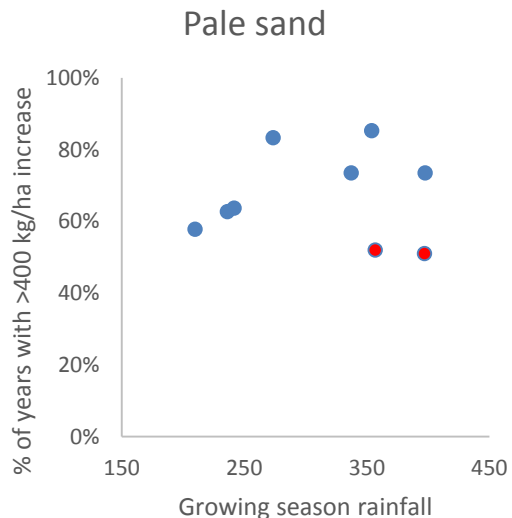


Long-term simulations - Yathroo



Where are economic yield increases more likely?

Partial amelioration of severe constraint to 30 cm.



Merredin, Perenjori, Newdegate, Wongan Hills, Northam, Moora, **Katanning**, **Kojonup**, Northampton

Key points

- Crop response to soil amelioration is variable, and depends on seasonal distribution of rainfall
- For severe soil constraints, more likely to get economic yield benefits
- Know the level and depth of your constraint!



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