

Canola under different nitrogen and water regimes in south Australian Mediterranean environments



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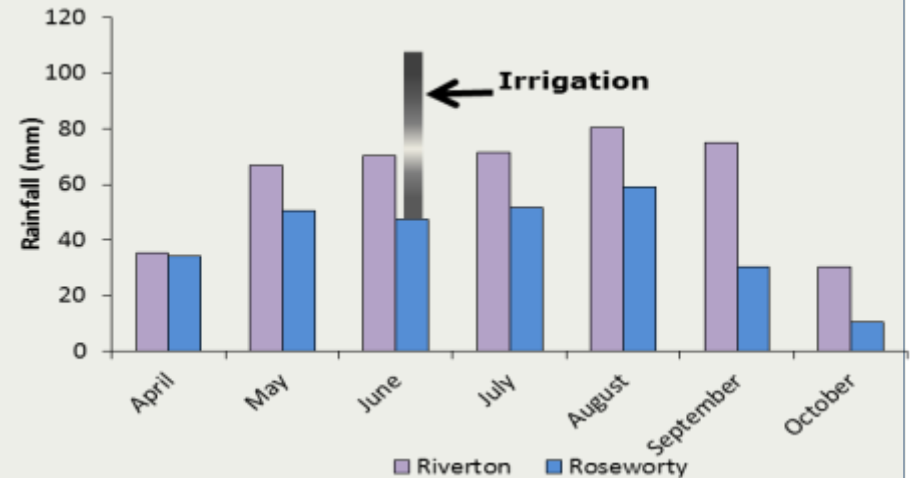
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Background

- Water and nitrogen (N) availability are the most critical factors for sustaining canola productivity.
- Canola has a high N requirement and how best to manage N in an environment where rainfall is variable is a challenging problem.
- **Hypothesis:** Similar or higher grain yield can be achieved with single targeted application of N at critical phenological stage than split applications of similar N rate.

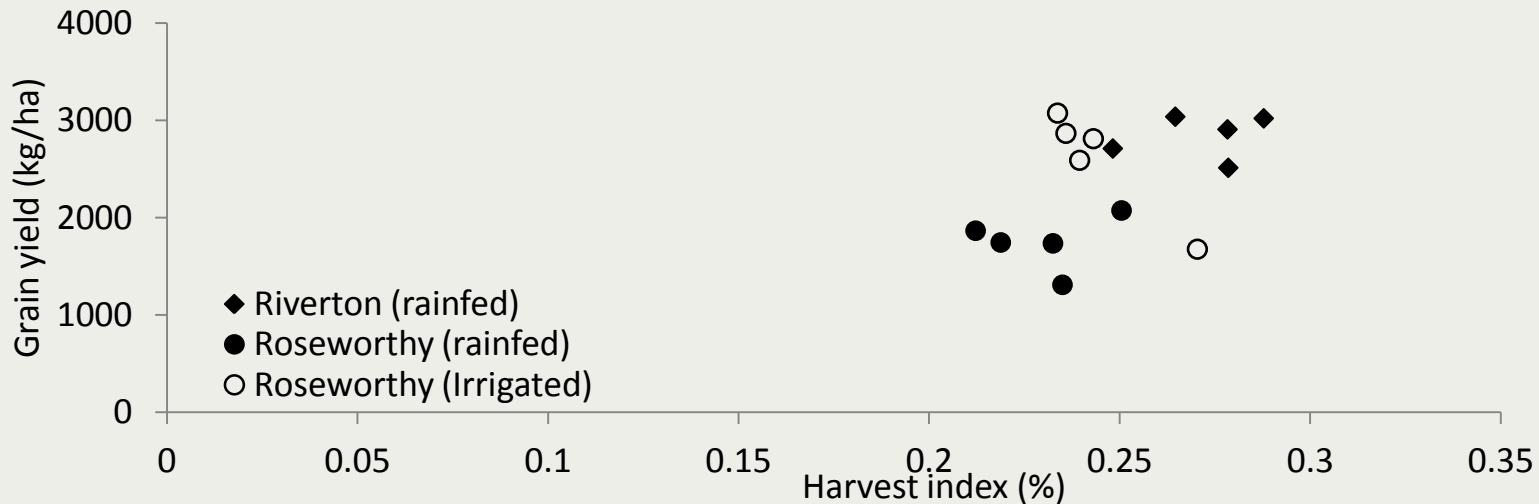
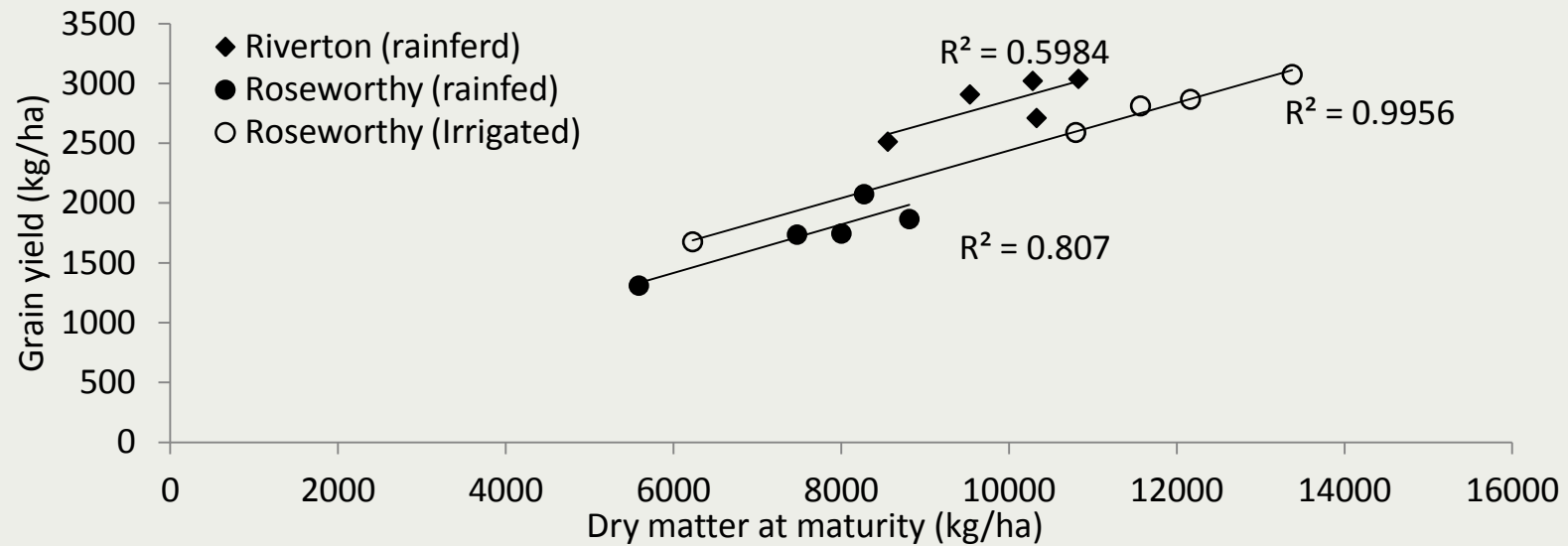
Methodology

- Cultivar: Hyola 575CL
- Growing season rainfall;
 - Riverton- 430mm
 - Roseworthy- 284mm
 - Irrigation at Rosette stage= 60mm (only at Roseworthy)

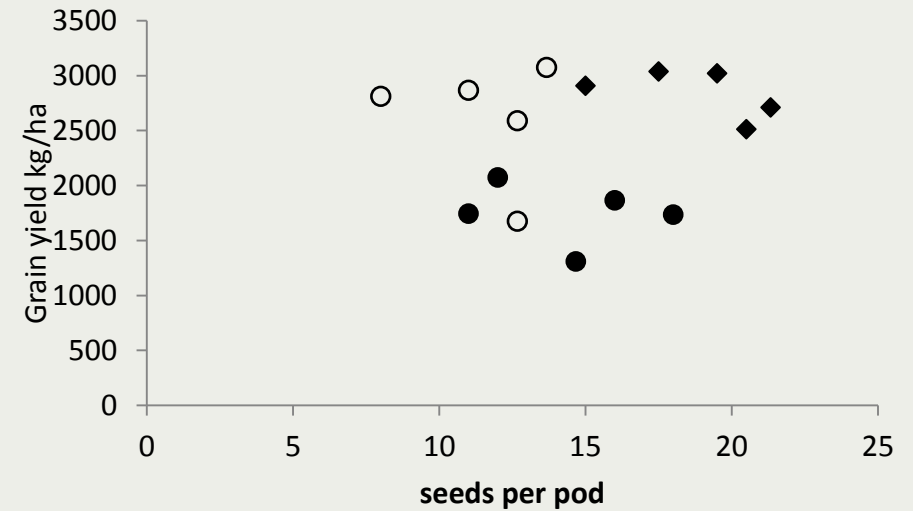
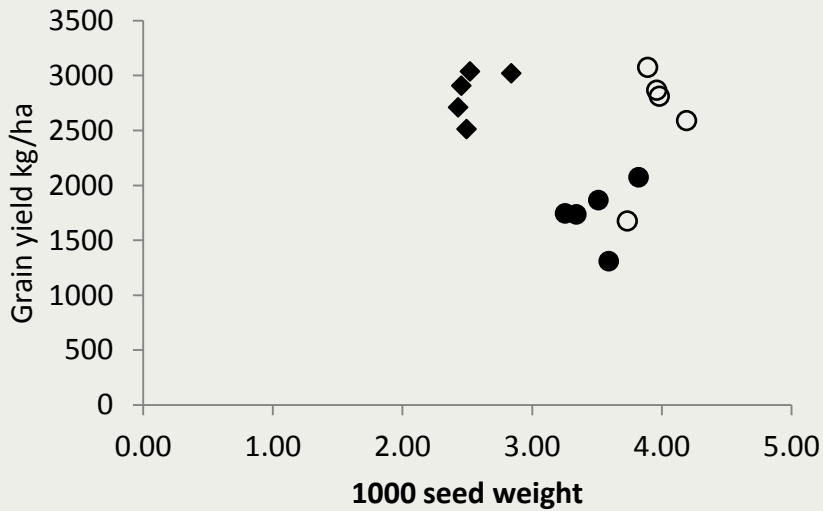
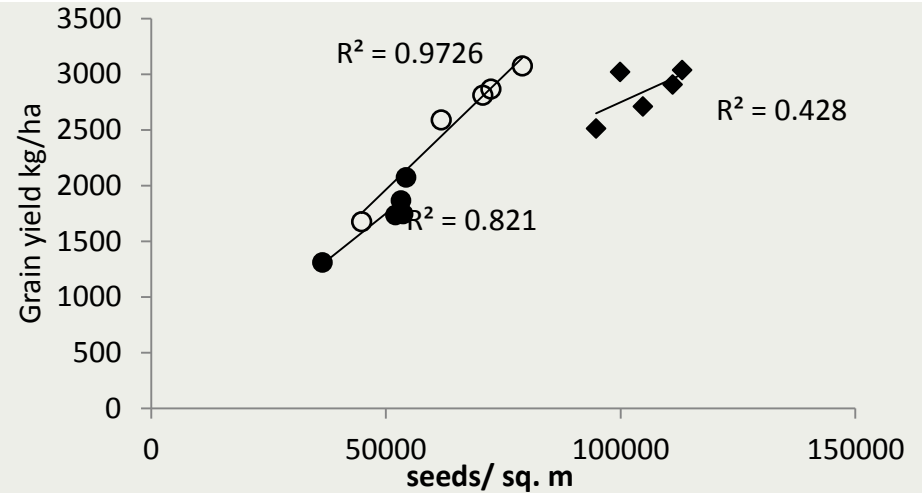
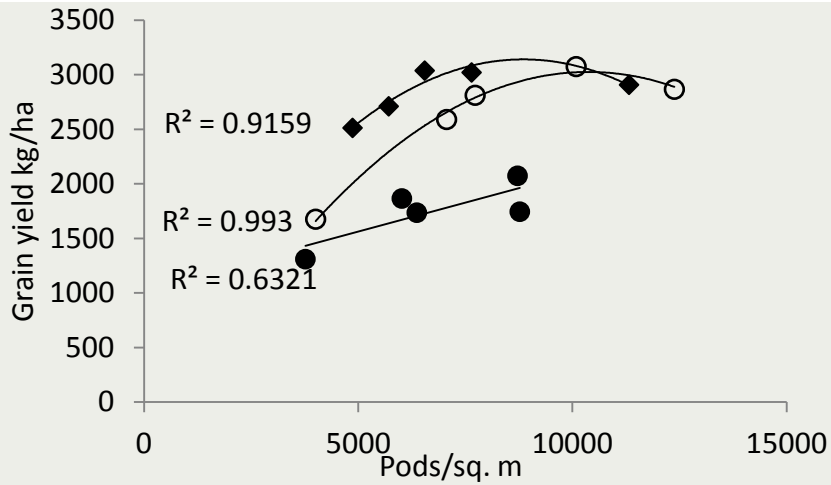


N Treatments	N Rate (Kg/ha)	Growth Stages			
		Emergence (GS10)	Rosette (GS30)	Green-bud (GS51)	Flowering (GS60)
N0	0				
N1	100	100			
N2	100		33	33	33
N3	200		66	66	66
N4	200	200			

Grain yield, total dry matter and harvest index

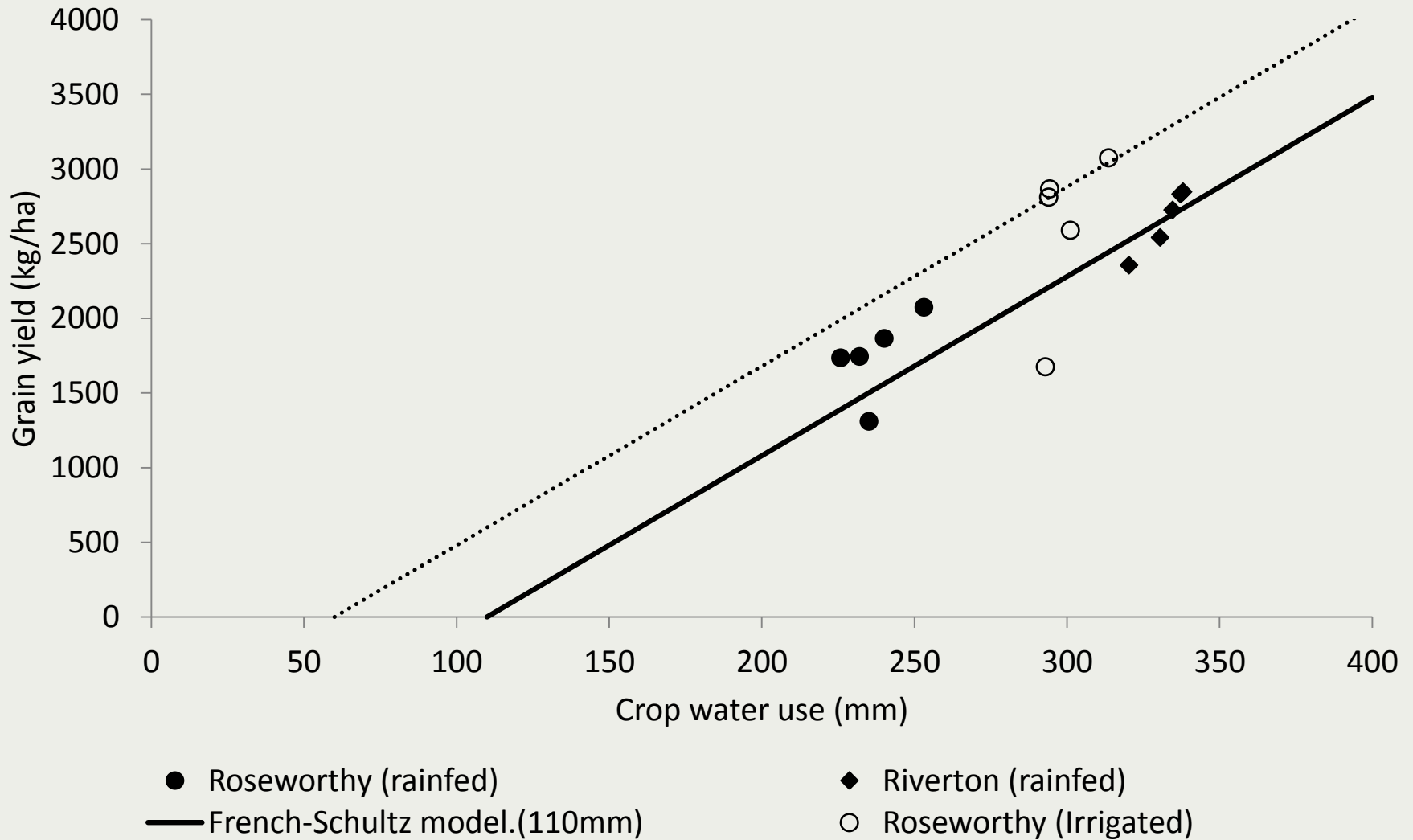


Yield components



○ Roseworthy (Irrigated) ● Roseworthy (rainfed) ◆ Riverton (rainfed)

Grain yield and Water use



Nitrogen and Water use efficiency

N Rate (kg /ha)	WUE		NUE _{sy}	
	Roseworthy	Riverton	Roseworthy	Riverton
0	5.72	8.53	11.9	17.7
100	8.44	9.32	9.9	11.84
200	9.01	9.61	7.6	8.69
Lsd _{0.05}	1.7	NS	1.9	1.89

N Rate (kg/ha)	WUE		NUE _{sy}	
	Roseworthy	Riverton	Rw	Riverton
Single	8.5	9.59	8.6	10.49
Splits	8.95	9.34	8.9	10.04
Lsd _{0.05}	NS	NS	NS	NS

Water use efficiency

N treatments (kg/ha)	Water use (mm)			Grain yield (kg/ha)			Marginal WUE (Kg/ha/mm)
	Irrigated	Rainfed	Difference	Irrigated	Rainfed	Difference	
0	293	235	58	1676	1310	366	6.33
100	301	232	69	2590	1745	845	12.2
100 split	294	226	68	2812	1736	1076	15.8
200	314	240	74	3075	1866	1209	16.5
200 split	294	253	41	2867	2074	793	19.3

Take home messages

- Grain yield was driven by biomass production rather than harvest index.
- Timing of N had relatively little impact N response.
- N rate and timing had little effect on total crop water use.
- WUE were improved with additional water availability. (irrigated treatment).

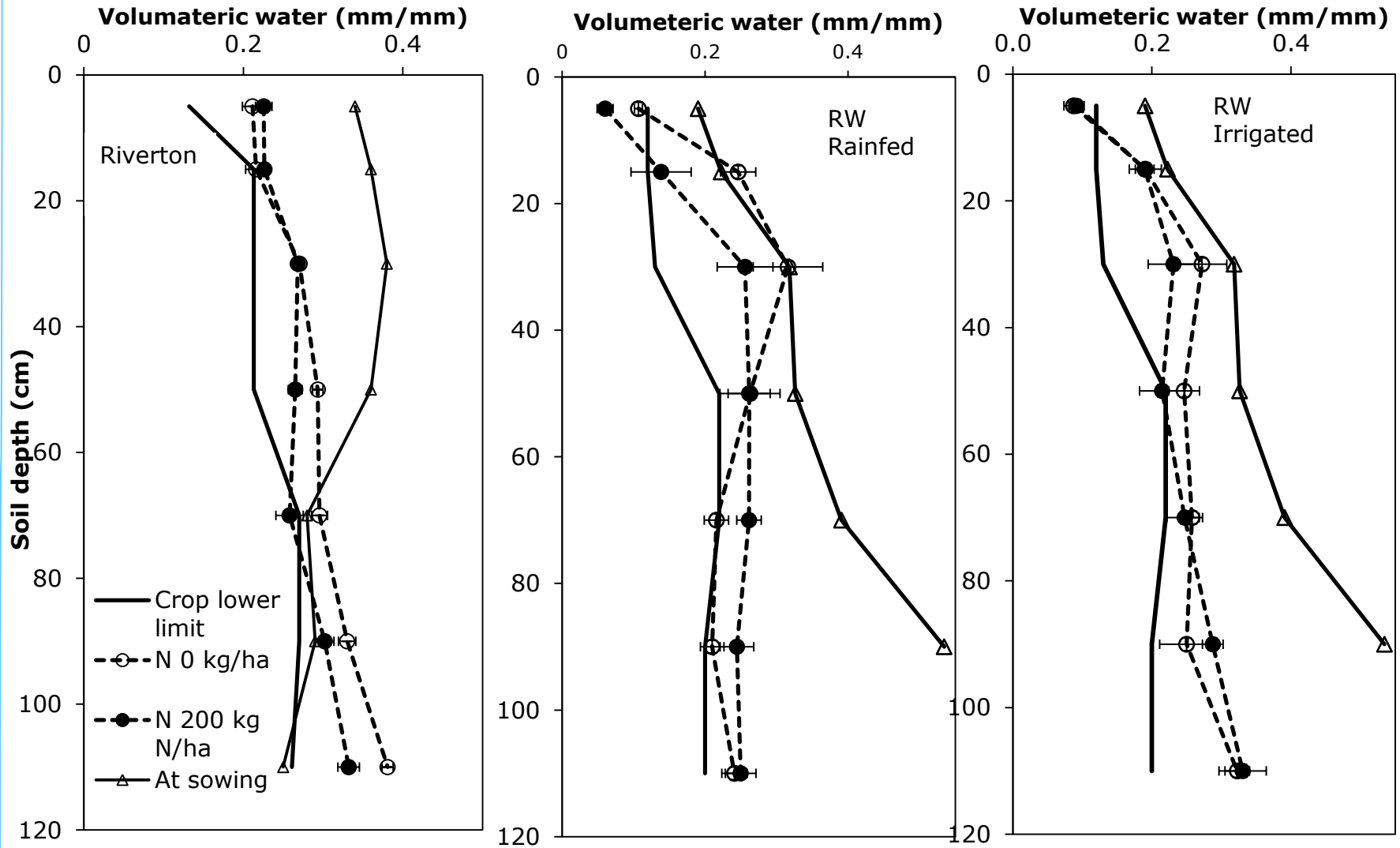
Acknowledgement

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- Andrew Etherton form Pacific Seeds
- Trent Potter

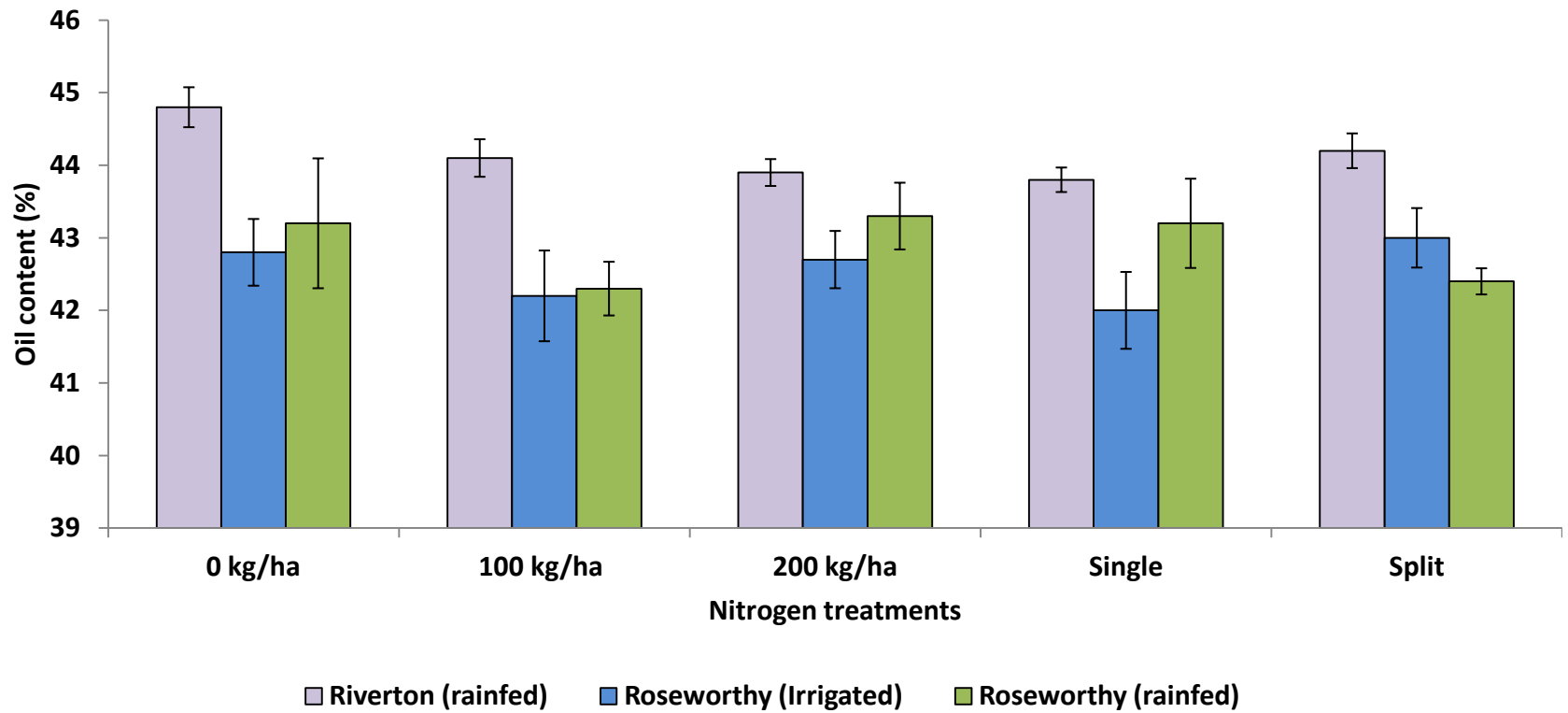
Thank You

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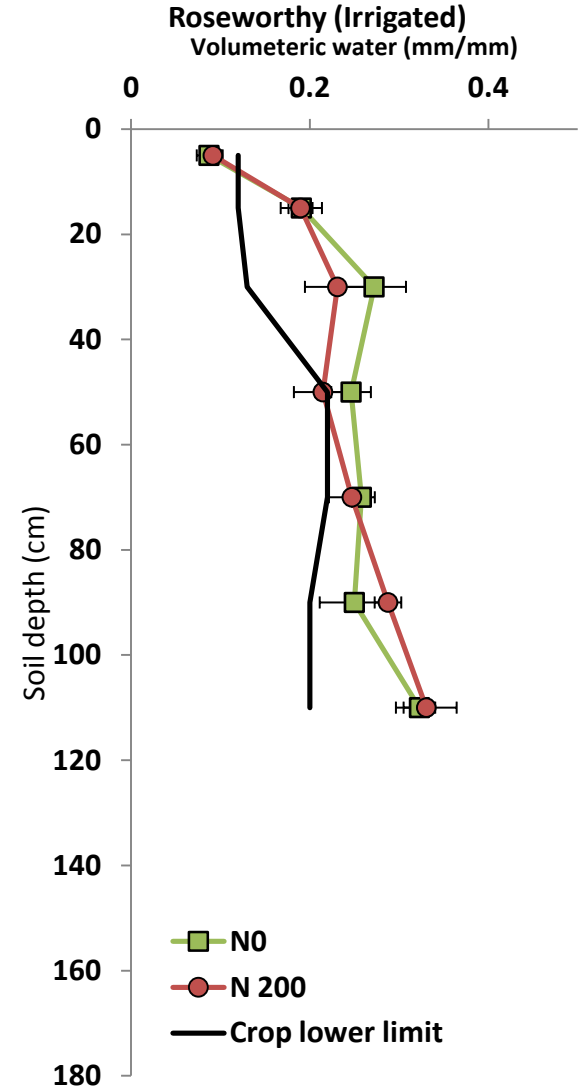
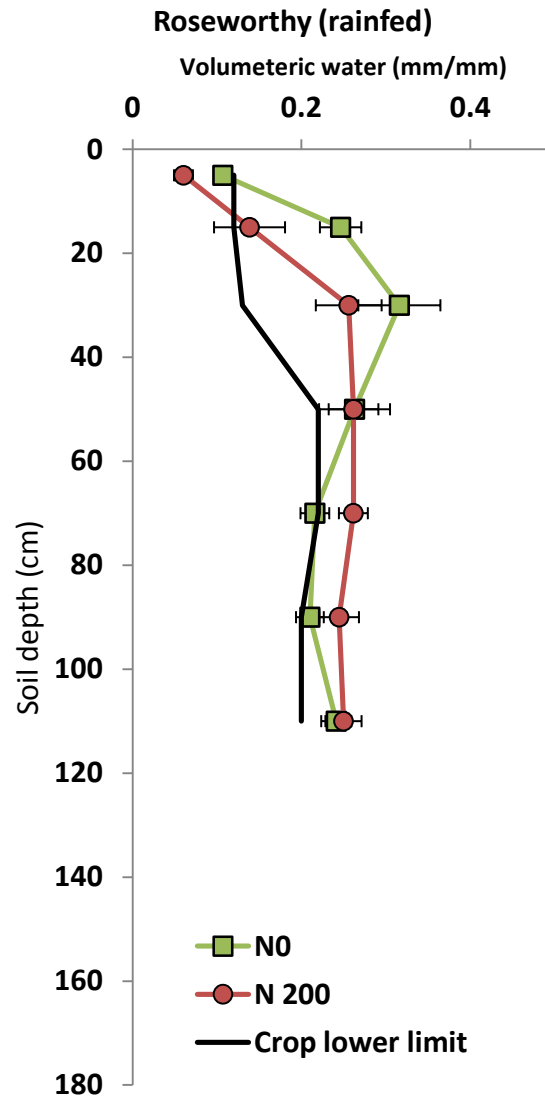
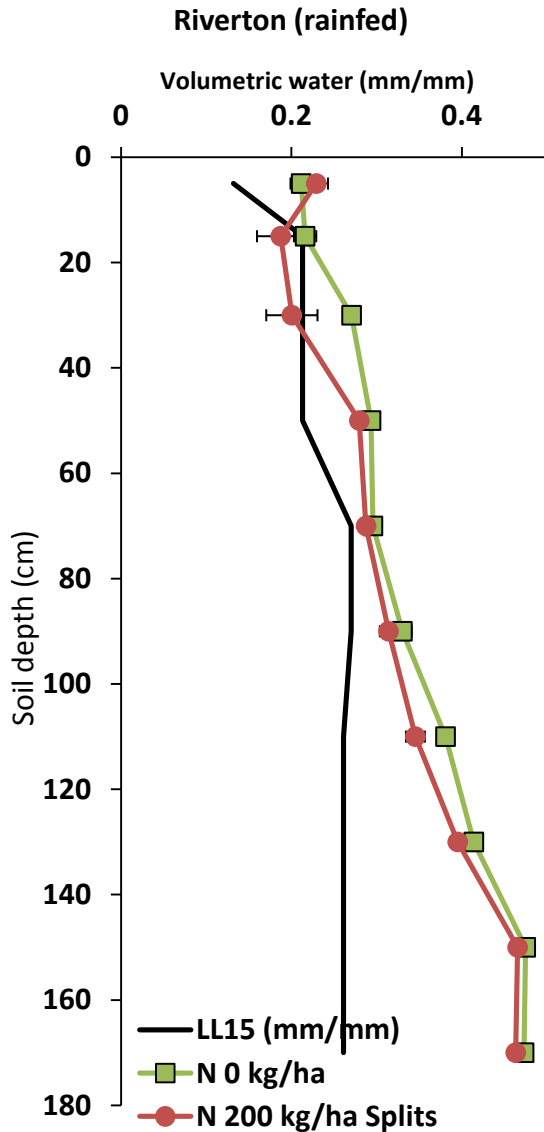
Soil water content



Oil content



Soil water content at maturity



Water use patterns at maturity

