

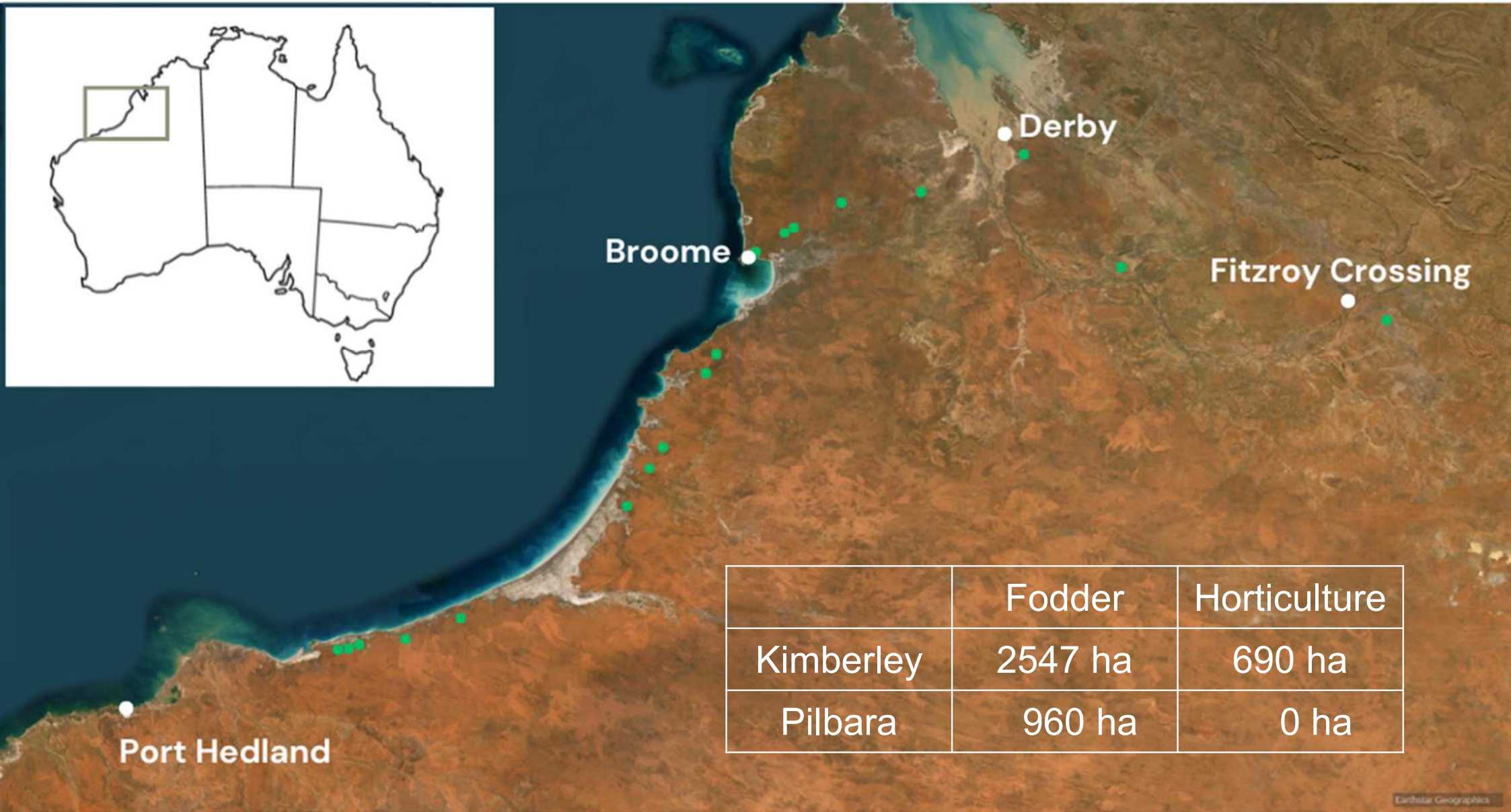


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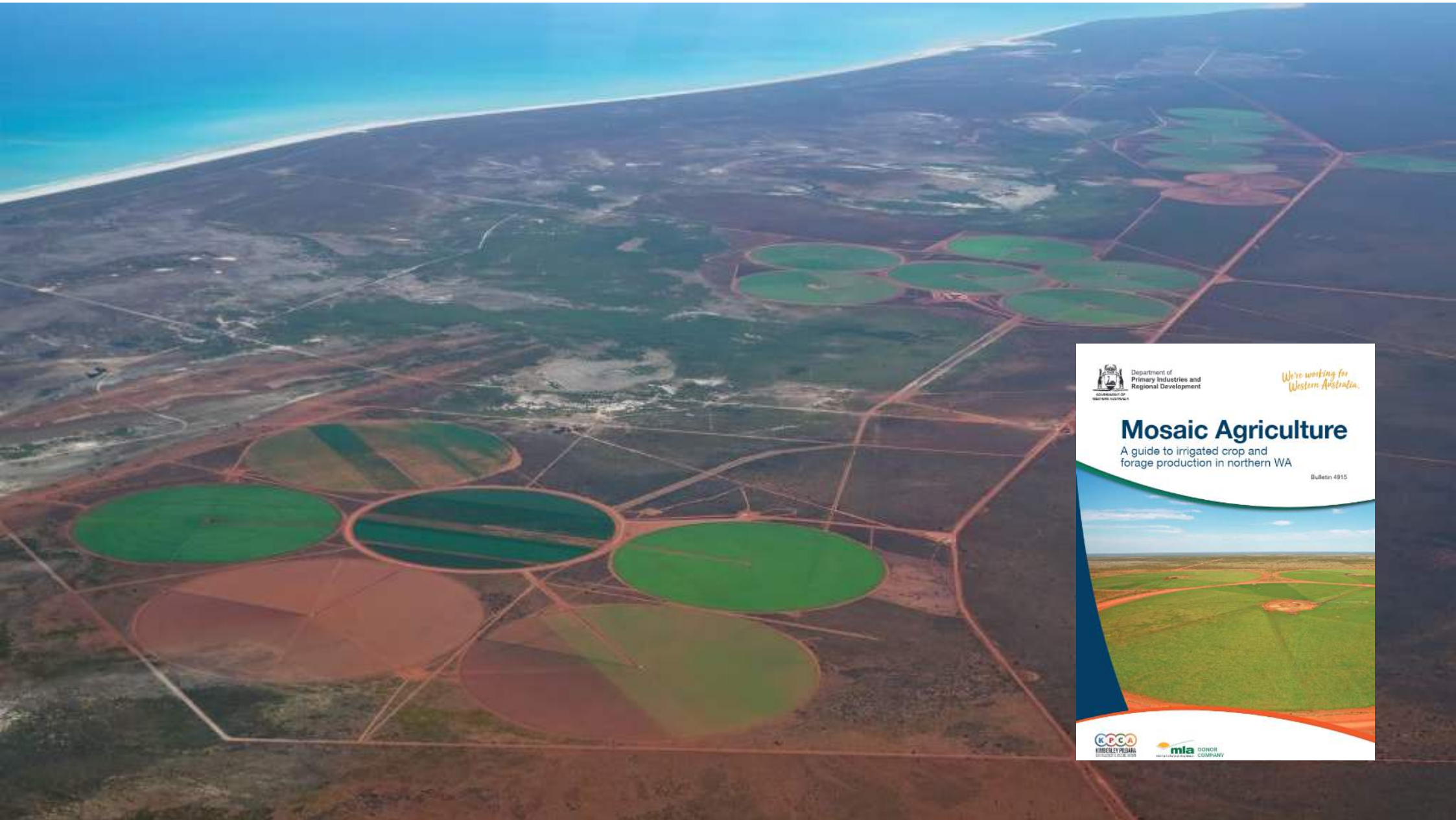
Protect
Grow
Innovate


Nitrogen-use efficiency of Rhodes grass in northern WA

Carla Milazzo, Development Officer



	Fodder	Horticulture
Kimberley	2547 ha	690 ha
Pilbara	960 ha	0 ha



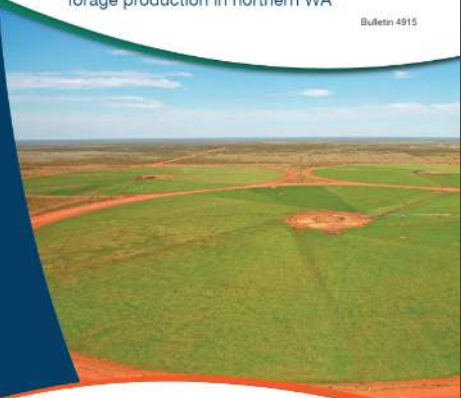
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Western Australia.*


Mosaic Agriculture

A guide to irrigated crop and
forage production in northern WA

Bulletin 4915



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Stand and graze



Cut and carry





Perennial grasses are highly productive

Cultivar	Species	kg DM/ha/day	t DM/ha/year
Reclaimer	Rhodes (<i>Chloris gayana</i>)	117.7	43.0
Callide	Rhodes (<i>Chloris gayana</i>)	114.8	41.9
Gatton	Panic (<i>Megathyrsus maximus</i>)	114.3	41.7
Megamax 059	Panic (<i>Megathyrsus maximus</i>)	111.8	40.8
Epica	Rhodes (<i>Chloris gayana</i>)	111.5	40.7
Mariner	Rhodes (<i>Chloris gayana</i>)	110.8	40.4
Endura	Rhodes (<i>Chloris gayana</i>)	110.6	40.4
Strickland	Digit (<i>Digitaria milanjjana</i>)	92.2	33.7
Premier	Digit (<i>Digitaria eriantha</i>)	82.0	29.9
Jarra	Digit (<i>Digitaria milanjjana</i>)	39.5	14.4
Splenda	Setaria (<i>Setaria splendida</i>)	–	–
Humidicola	(<i>Brachiaria humidicola</i>)	–	–

Nitrogen balance trial

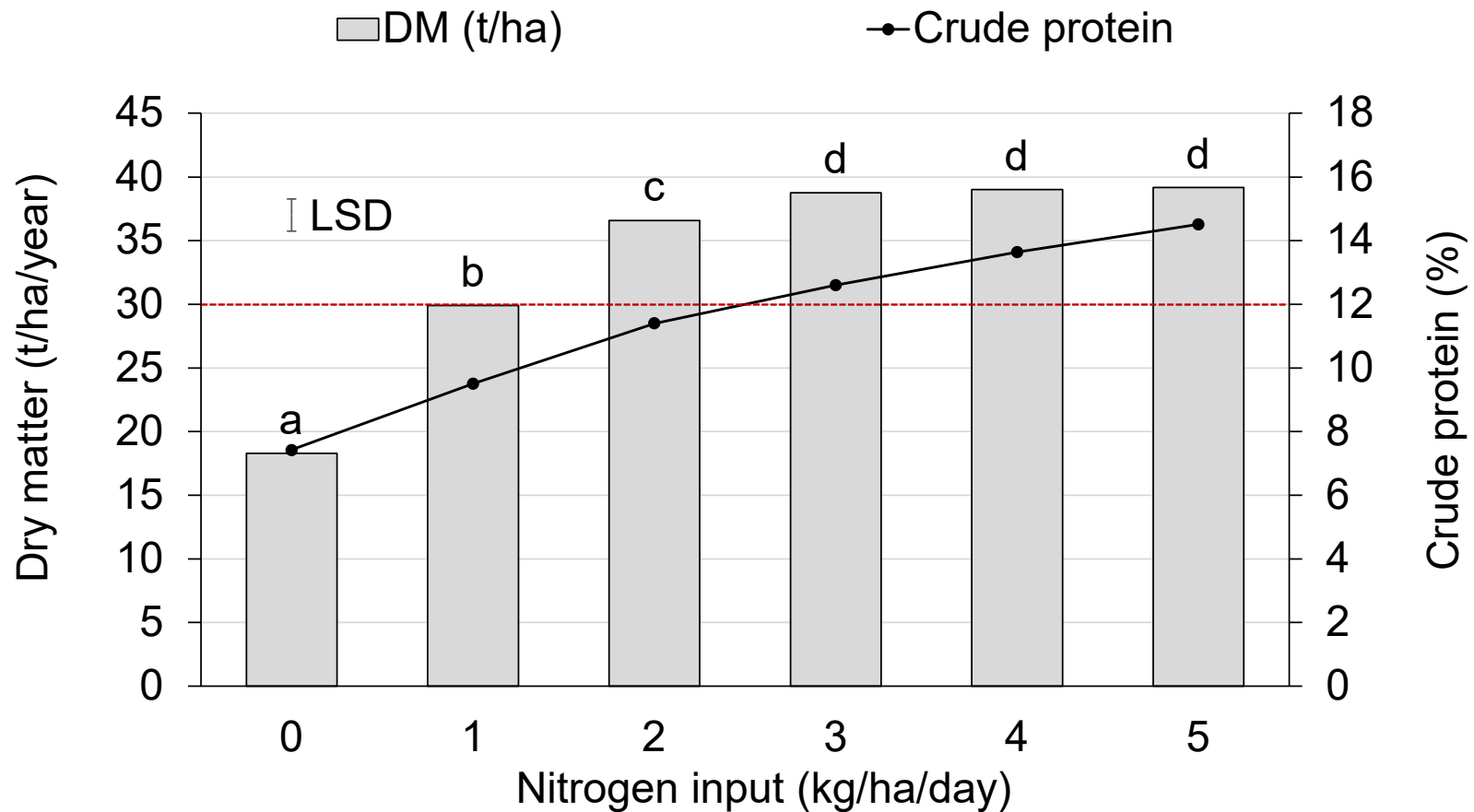
- Five nitrogen rates, plus control
- Three replicates, randomised
- Split-application urea every cycle
- Sampled every 28 days
- Hay harvested every ~30 days
- Lysimeters
- *23 sets of yield and feed quality data over 2 years*



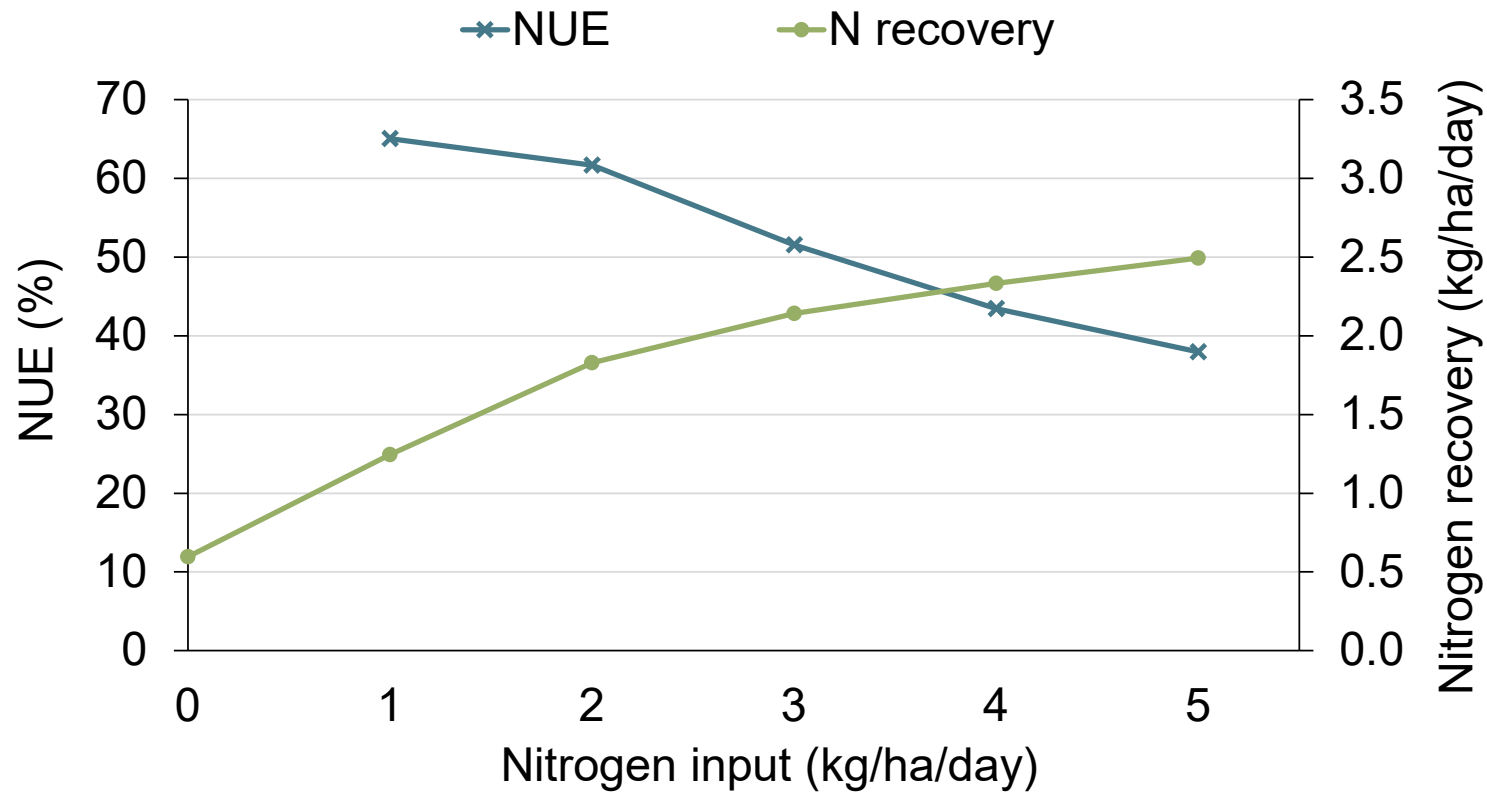
Treatments

	Nitrogen rate (kg/ha)			Urea rate (kg/ha)		
	per day	per cut	per year	per day	per cut	per year
0N	0	0	0	0	0	0
1N	1	30	365	2.2	65	793
2N	2	60	730	4.3	130	1587
3N	3	90	1095	6.5	196	2380
4N	4	120	1460	8.7	261	3174
5N	5	150	1825	10.9	326	3967

Productivity response



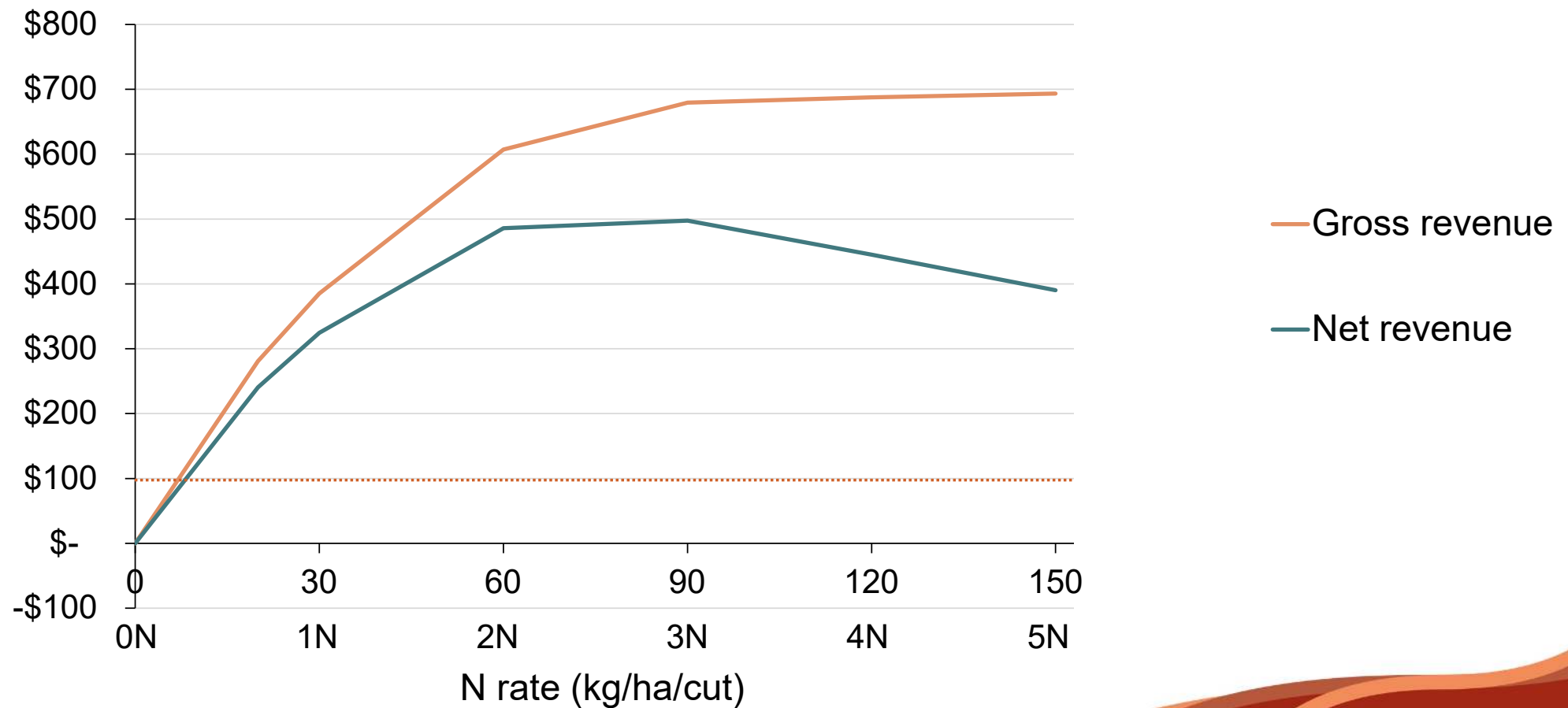
$$NUE = \frac{(N \text{ recovery in treatment}) - (N \text{ recovery in control})}{N \text{ applied}} \times 100$$



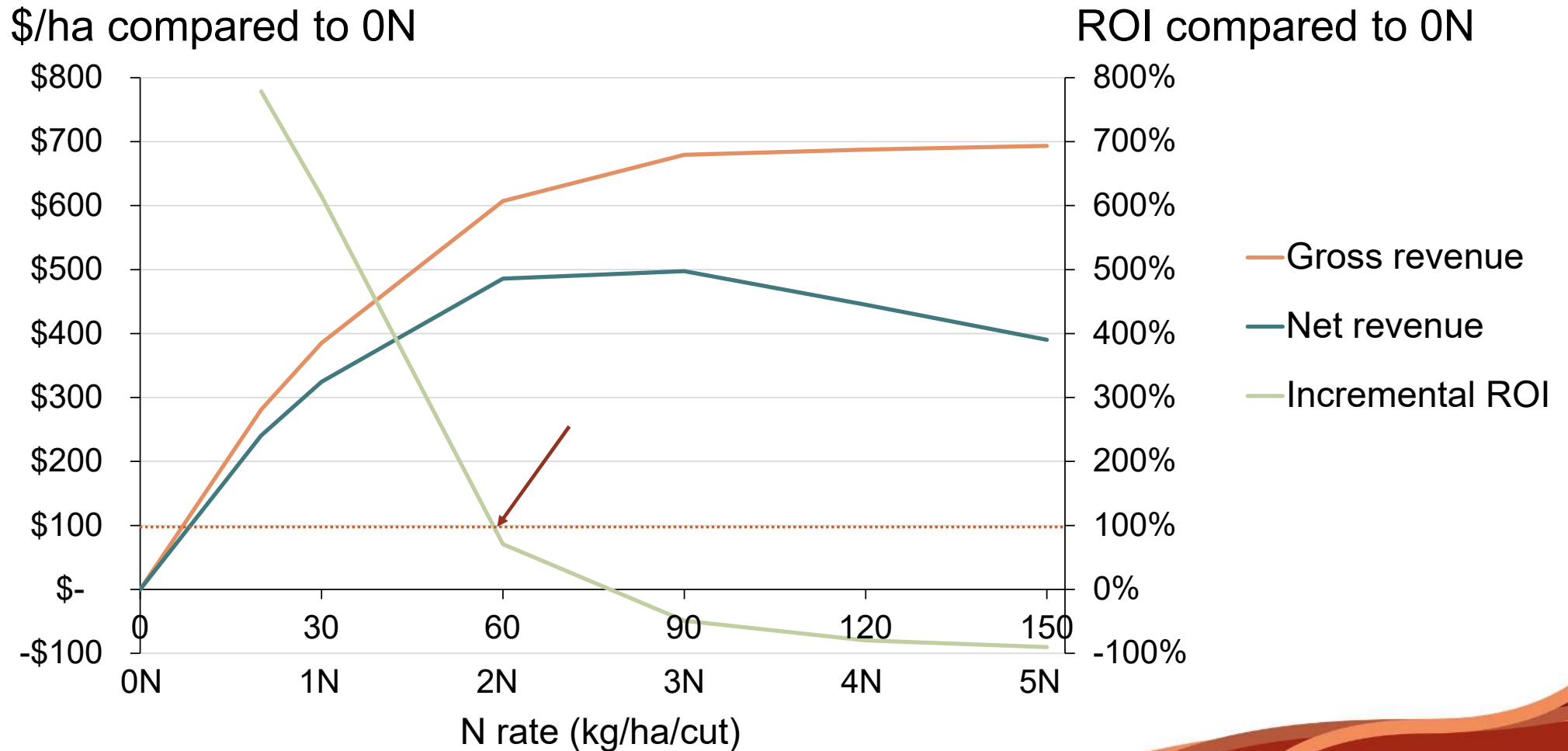
Return on investment per unit of N

\$/ha compared to 0N

ROI compared to 0N

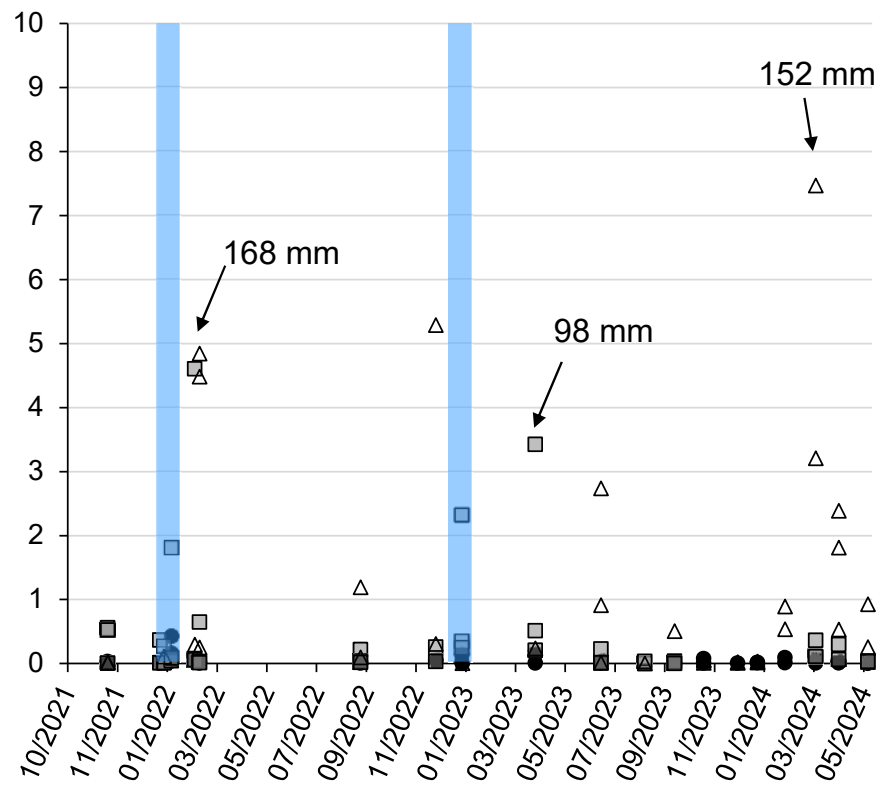
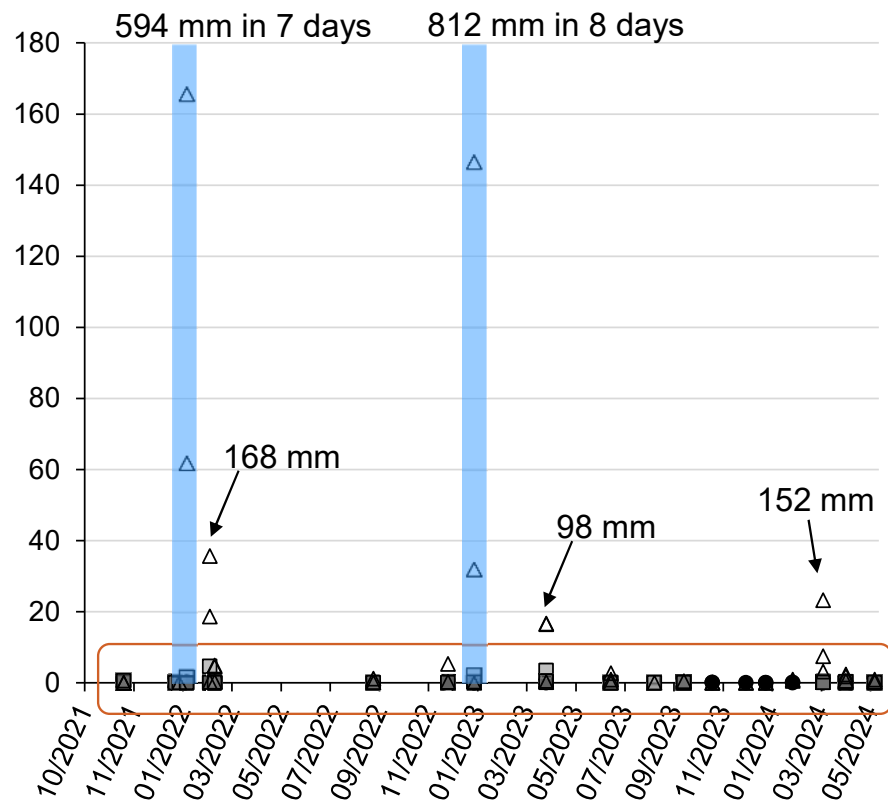


Return on investment per unit of N

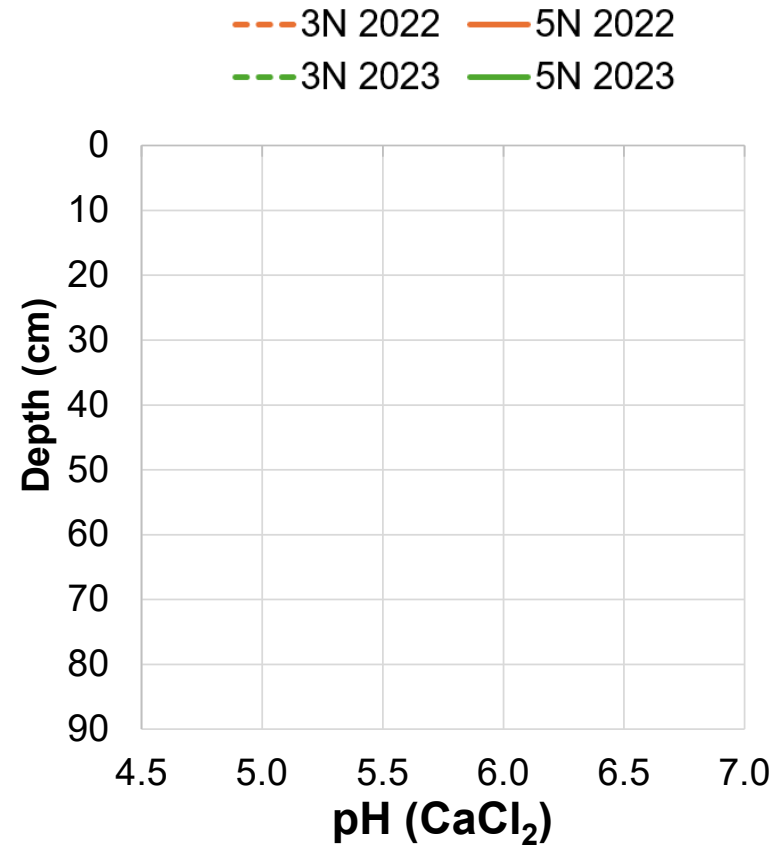
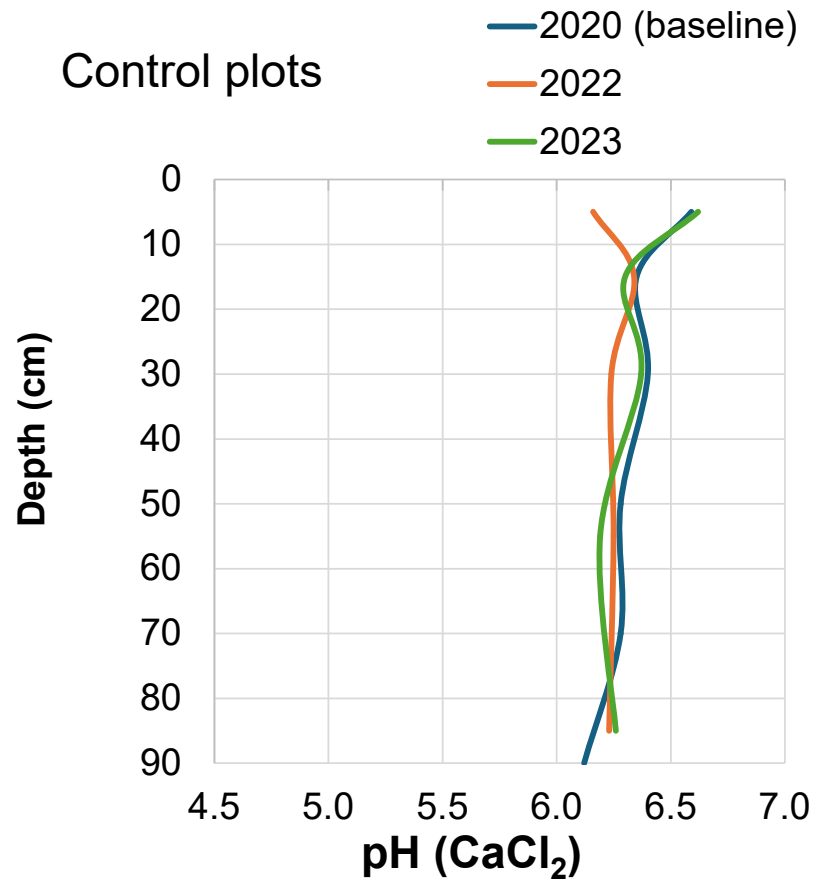


Nitrogen leached (kg/ha)

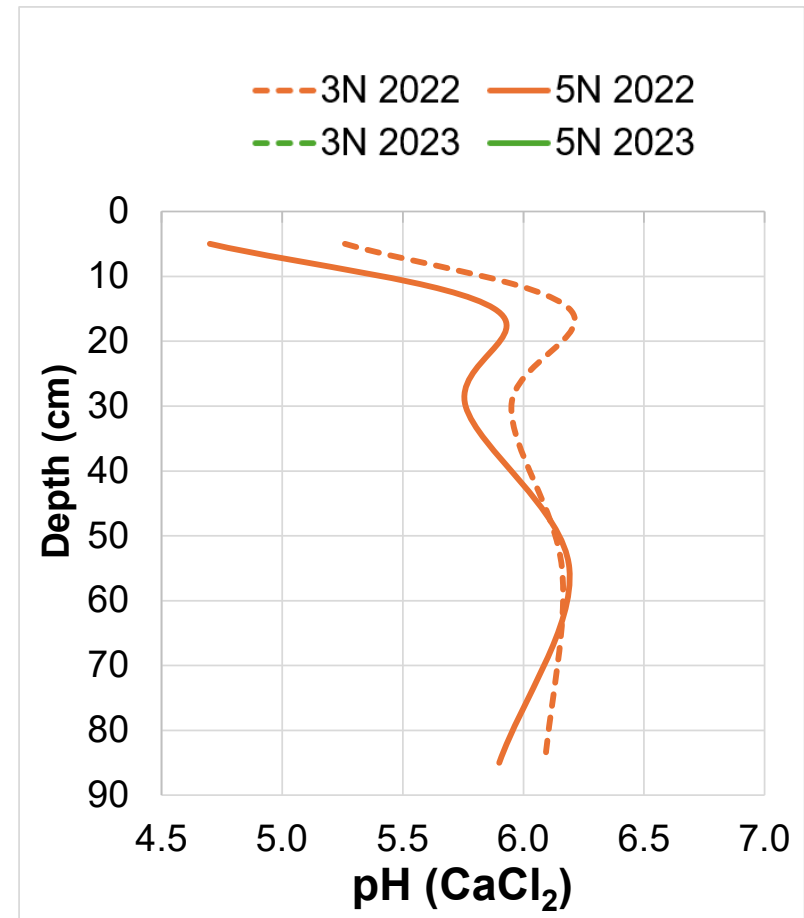
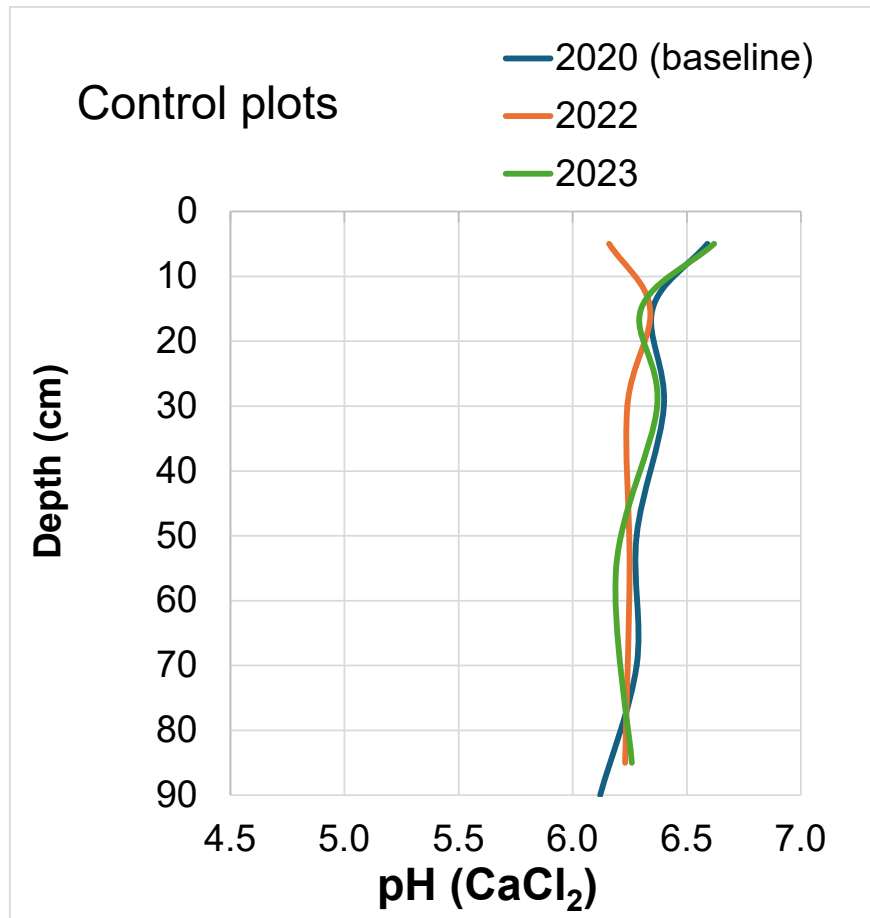
● 0N ◻ 3N △ 5N



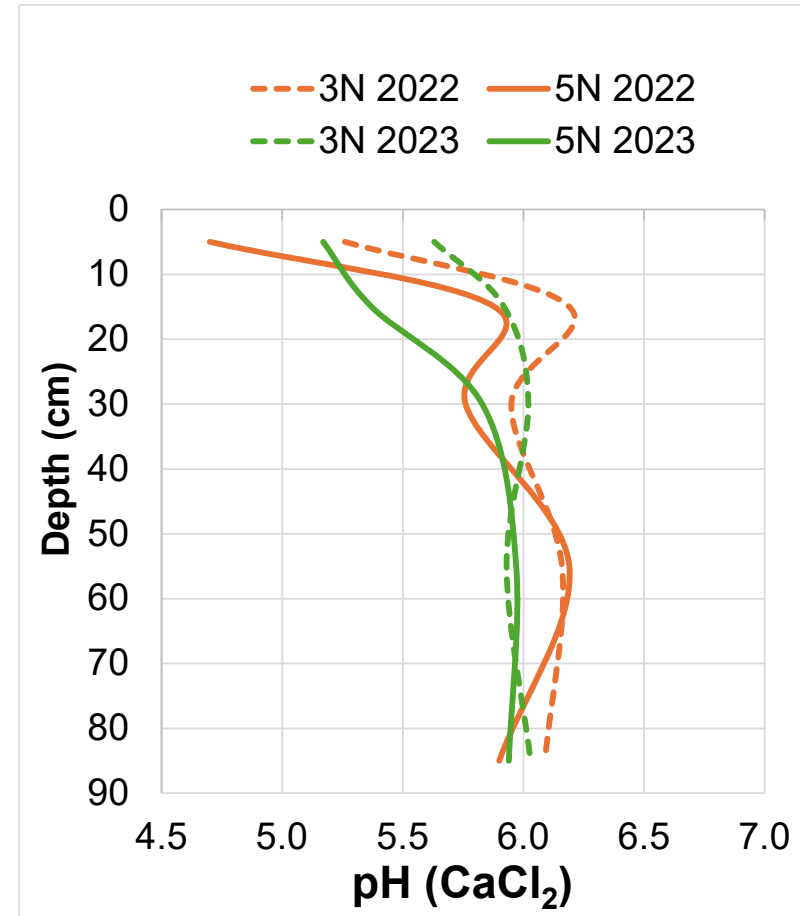
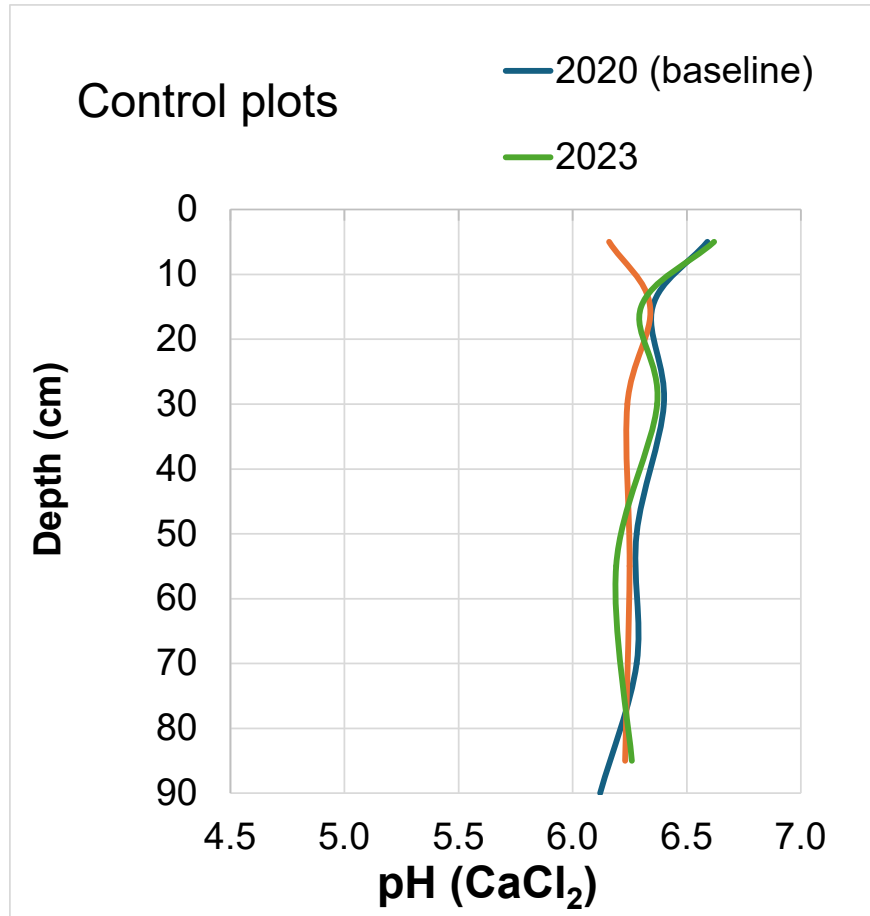
Long term implications




Long term implications



Long term implications



Summary

- Apply N for yield and ROI (is high protein worth it?)
 - High risk of N leaching over 3 kg N/ha/day in wet season
 - Monitor soil pH
 - Improving NUE:
 - N products and formulations
 - N application strategies
 - Soil health
 - GHG emissions
- 

Thank you

dpird.wa.gov.au    

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Important disclaimer

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