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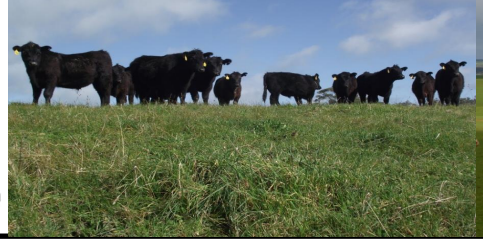

The Role of Reactive Rock Phosphate Fertilisers for Pastures in Australia

Australian Journal of Experimental Agriculture
Volume 37, Number 8, 1997 p845-1098

Published 1997
CSIRO Publishing

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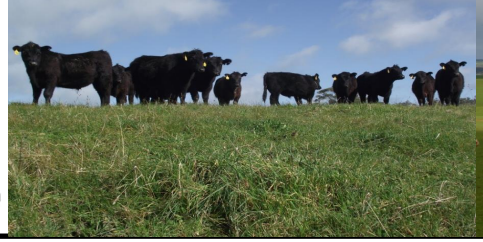

Aim of Study

- To evaluate the agronomic effectiveness of reactive phosphate rocks in a pasture environment
- An economic analysis of the field performance of reactive phosphate rock compared with single superphosphate

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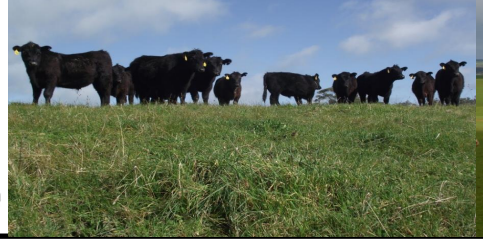

Materials and Methods

- Compare five reactive phoshate rocks (RPR) and single super phosphate (SSP), applied at four different application rates
  - 0, 17, 34 & 68 kg/ha of phosphorus
  - Annual dry matter data was collected every year between (1992-1999)
  - Phosphorus was applied in 1992-1995
  - No Phosphorus was applied between 1996-1999

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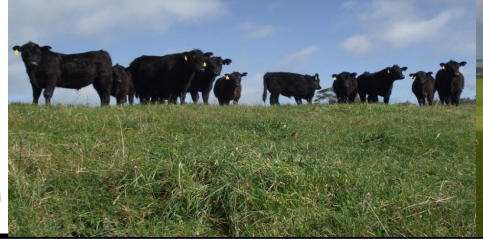

Site Characterisitcs

- Annual Rainfall > 850 mm (34 inch)
- Acidic topsoil; pH (water < 5.5)
- Light textured soil
- Elevated aluminium saturation
- White clover, sub clover, strawberry clover, perennial ryegrass & tall fescue
- Predominantly a beef/dairy production area

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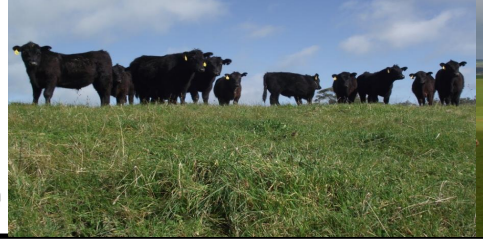

Fertiliser Comparison

Fertiliser	Source	Total Phosphorus (%)	Type	2% Citric Acid	2% Formic Acid
Single Super Phosphate	n.a.	8.8	Soluble	87	100
Triple Super Phosphate	n.a.	20.2	Soluble	99	93
Partially Acidulated Phosphate Rock	n.a.	9.7	Partly soluble	68	71
AeroPhos	n.a.	24	Soluble	n.a.	n.a.
Sechura	Peru	12.9	RPR	40	70
North Carolina	USA	12.7	RPR	36	74
Hamrawein	Egypt	12.7	RPR	31	49
Khouribja	Morocco	14.2	RPR	28	56
Duchess	Queensland	10.5	PR	30	45

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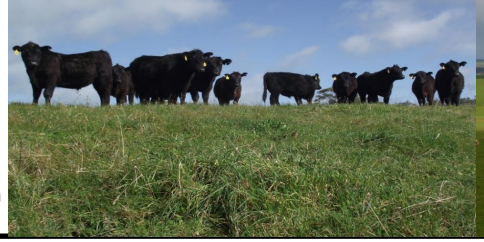
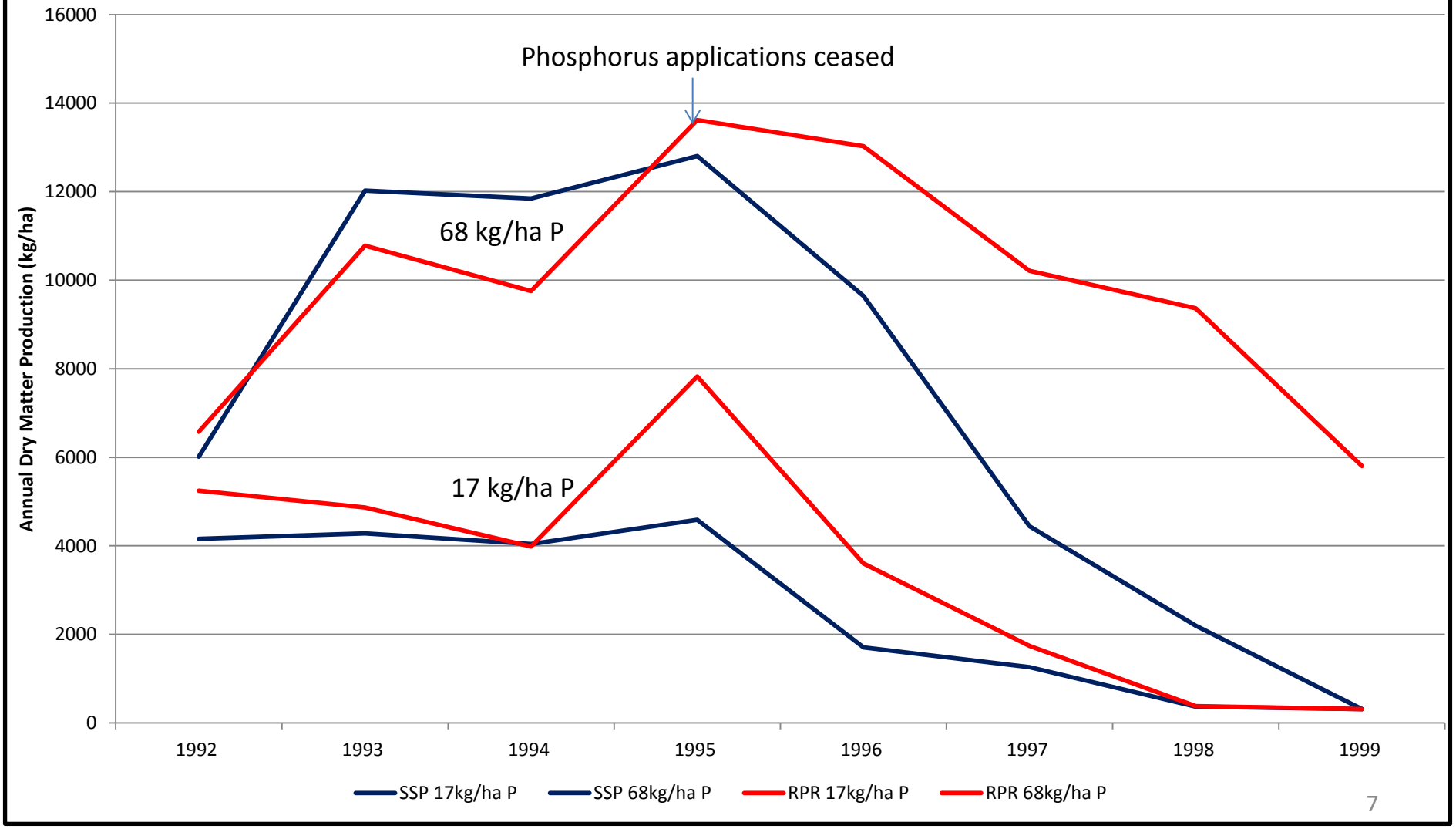


Yearly Dry Matter Totals (Fertiliser applied 1992-1995)



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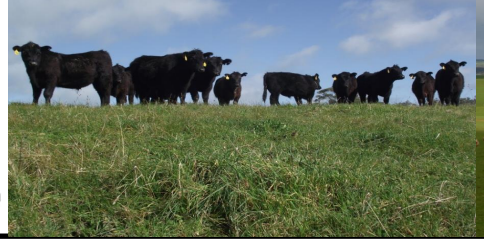
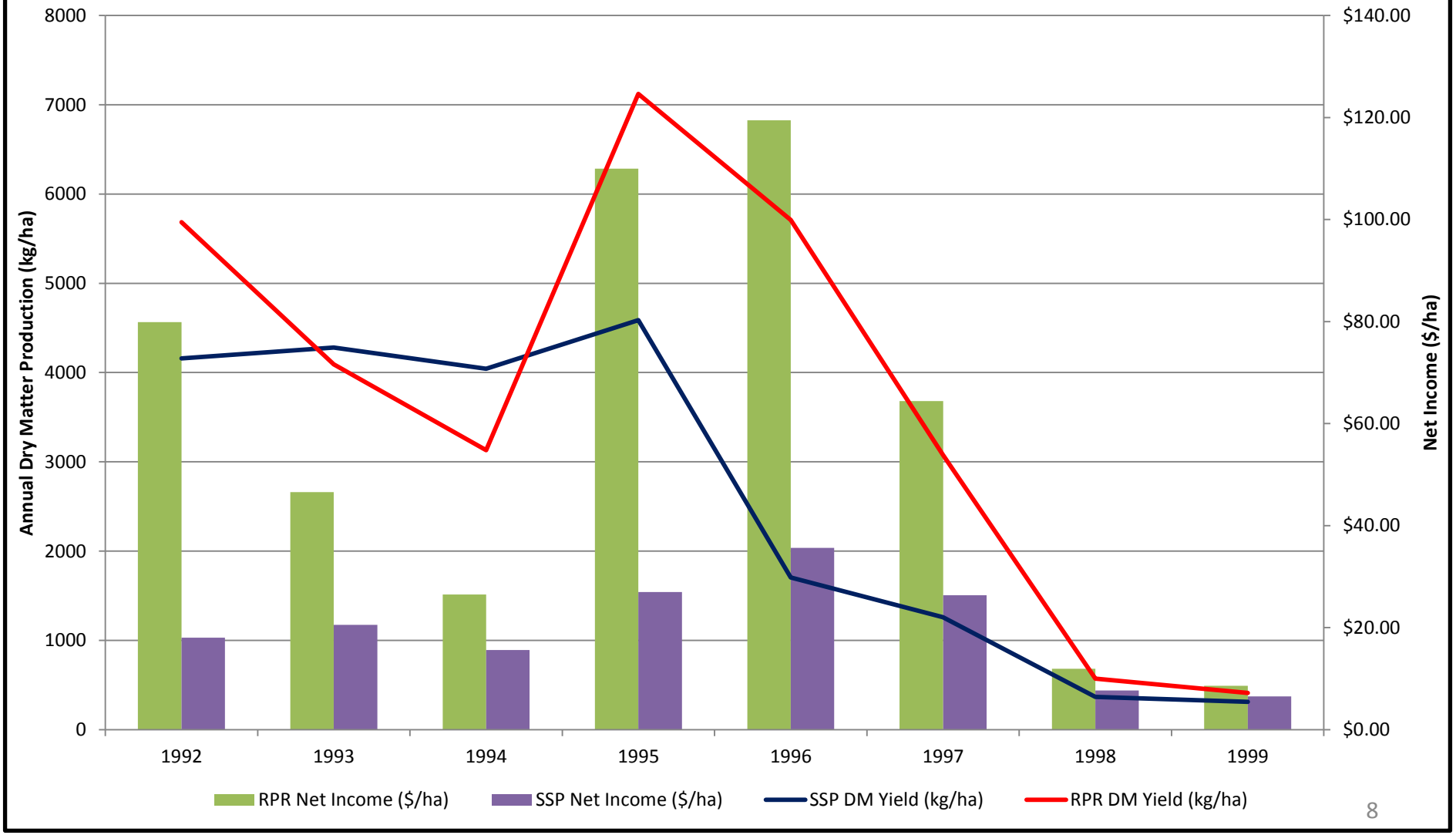


Yearly Dry Matter Total & Yearly Net Income (17kg/ha P)



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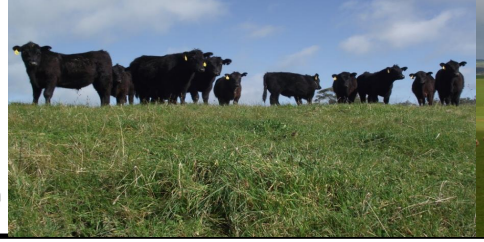
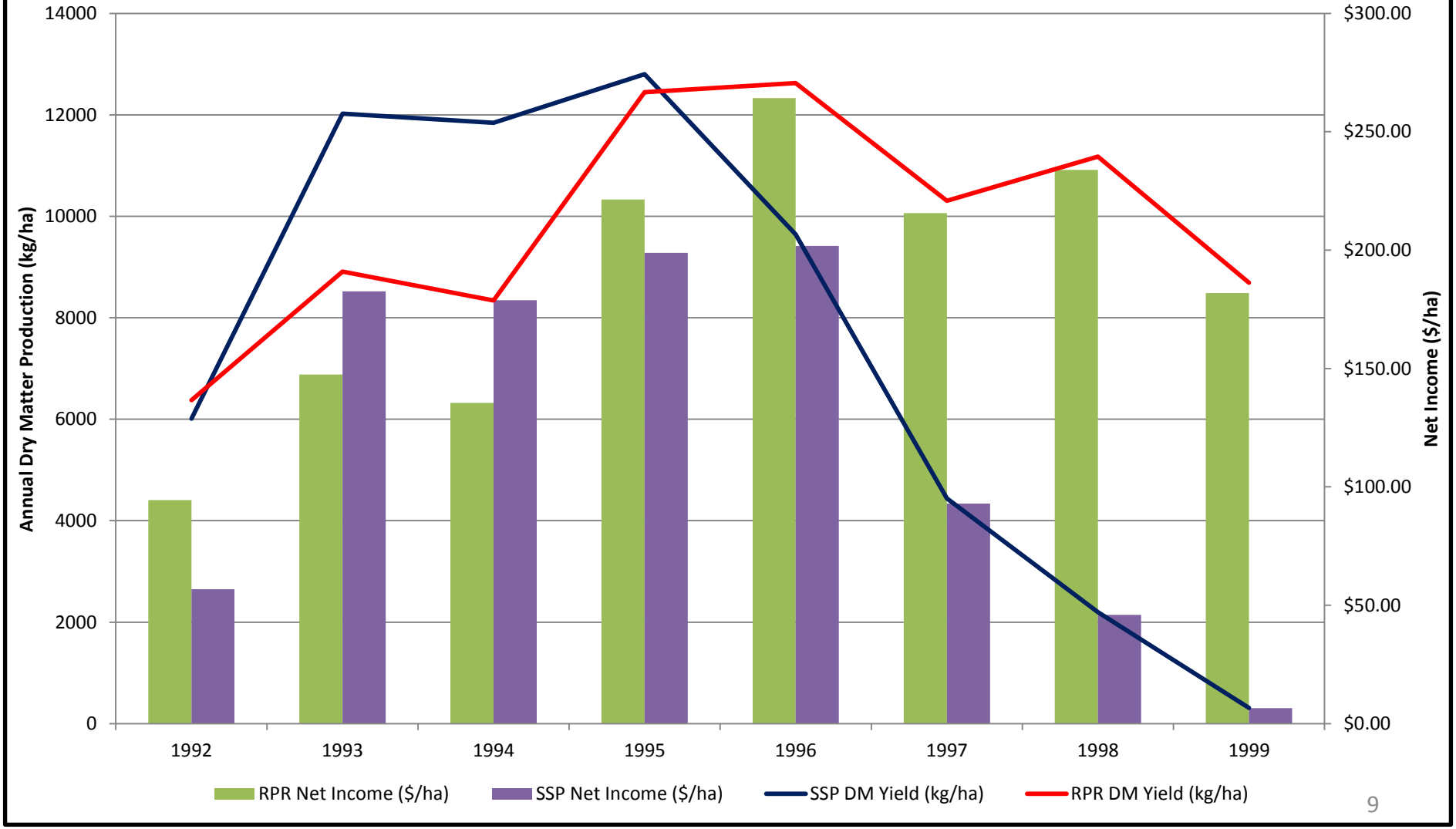


Yearly Dry Matter Total & Yearly Net Income (68kg/ha P)



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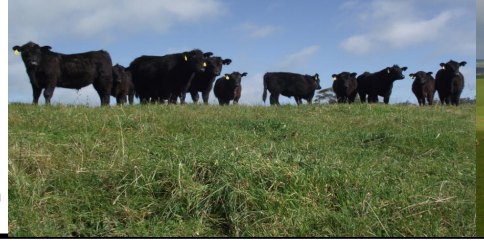
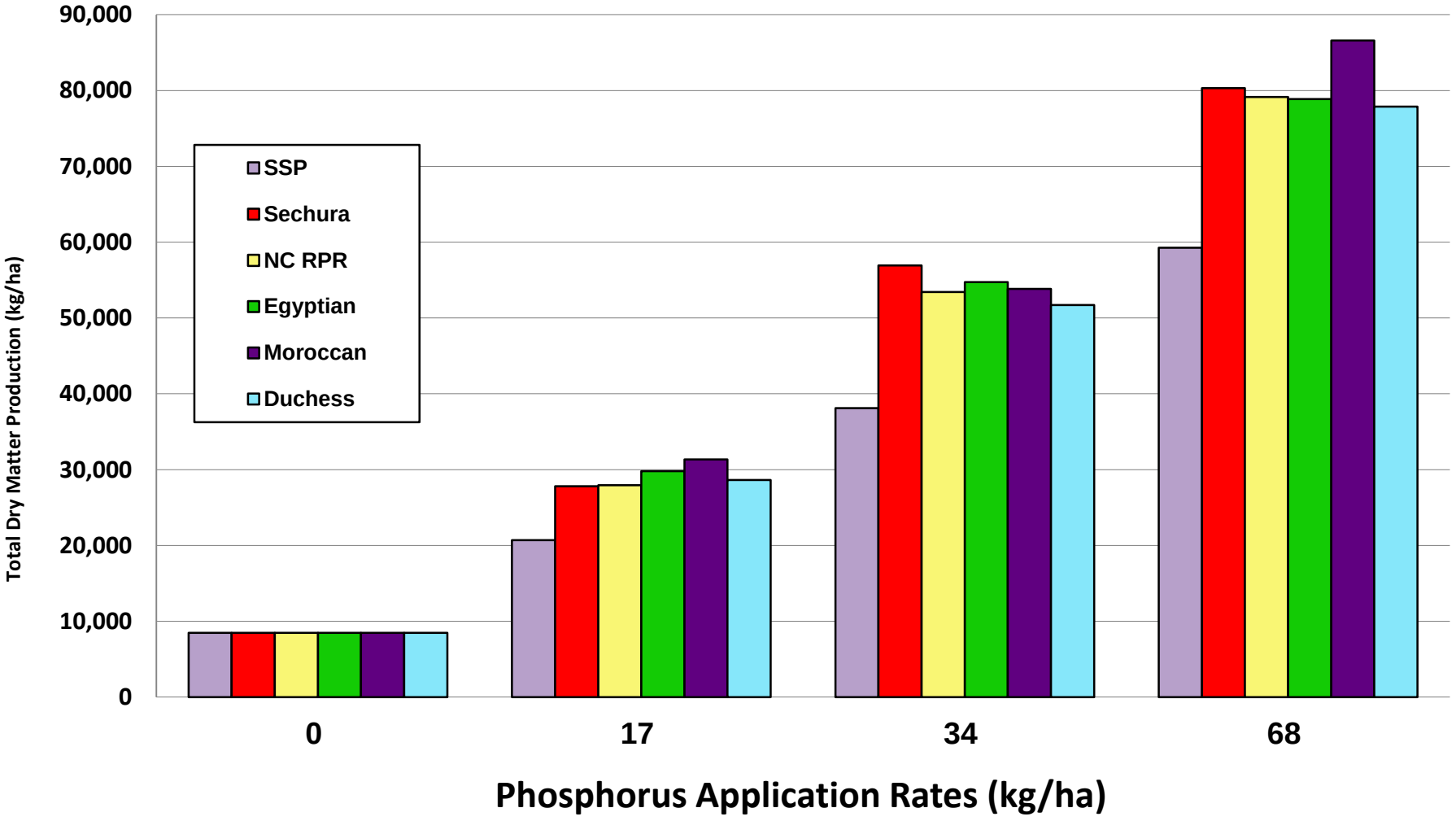


Total DM Yield (1992 - 1999)



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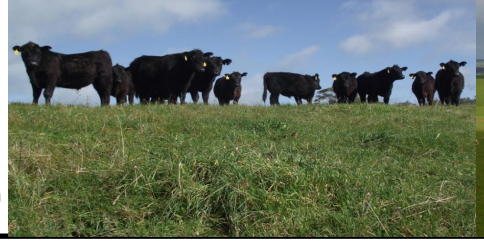

Rock phosphate and superphosphate as sources of phosphorus for subterranean clover on an acid sandy soil

Waite Agricultural Research Institute
Glen Osmond, South Australia

A.M. Alston and K.W. Chin
Published 1974

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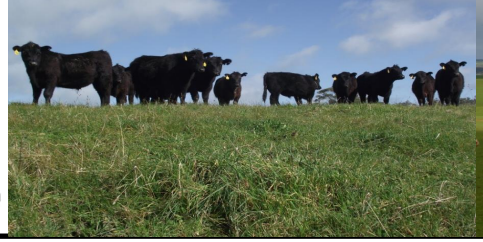

Aim of Study

- To quantify the dry matter production of subterranean clover when reactive phosphate rock and superphosphate have been applied
- To measure the residual soil phosphorus levels after additions of reactive phosphate rock and superphosphate

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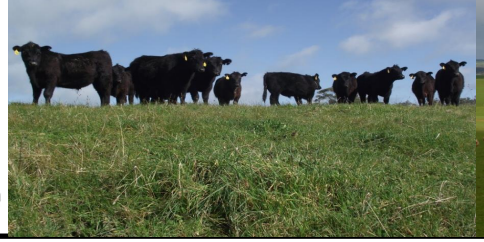

Materials & Method

- Randomized block design, 4 replications
- RPR and SSP were applied at four application rates 0, 11, 22 and 66kg/ha P
- Phosphorus applications occured in the Autumn, for the first year of the trial only
- Dry matter yield was determined in Oct/Nov each season, and the phosphorus content analysised
- Soil phosphorus levels were evaluated post harvest every year

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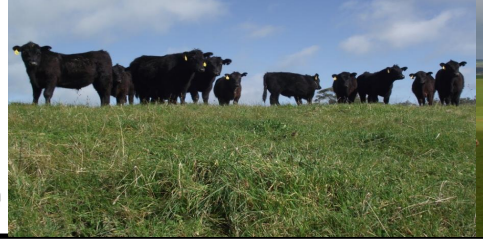

Site Characteristics

- Soil contained 0.1% N, 2.0% OC, 89ppm total P, 33ppm colwell P and a pH of 5.5 (water)
- Annual rainfall 837mm (33inches)
- Average min and max temperatures in January were 27.3 and 11.4 and July were 12.3 and 4.4
- Subterrean clover

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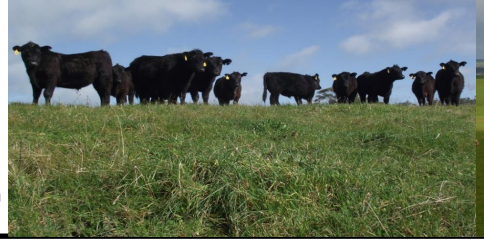
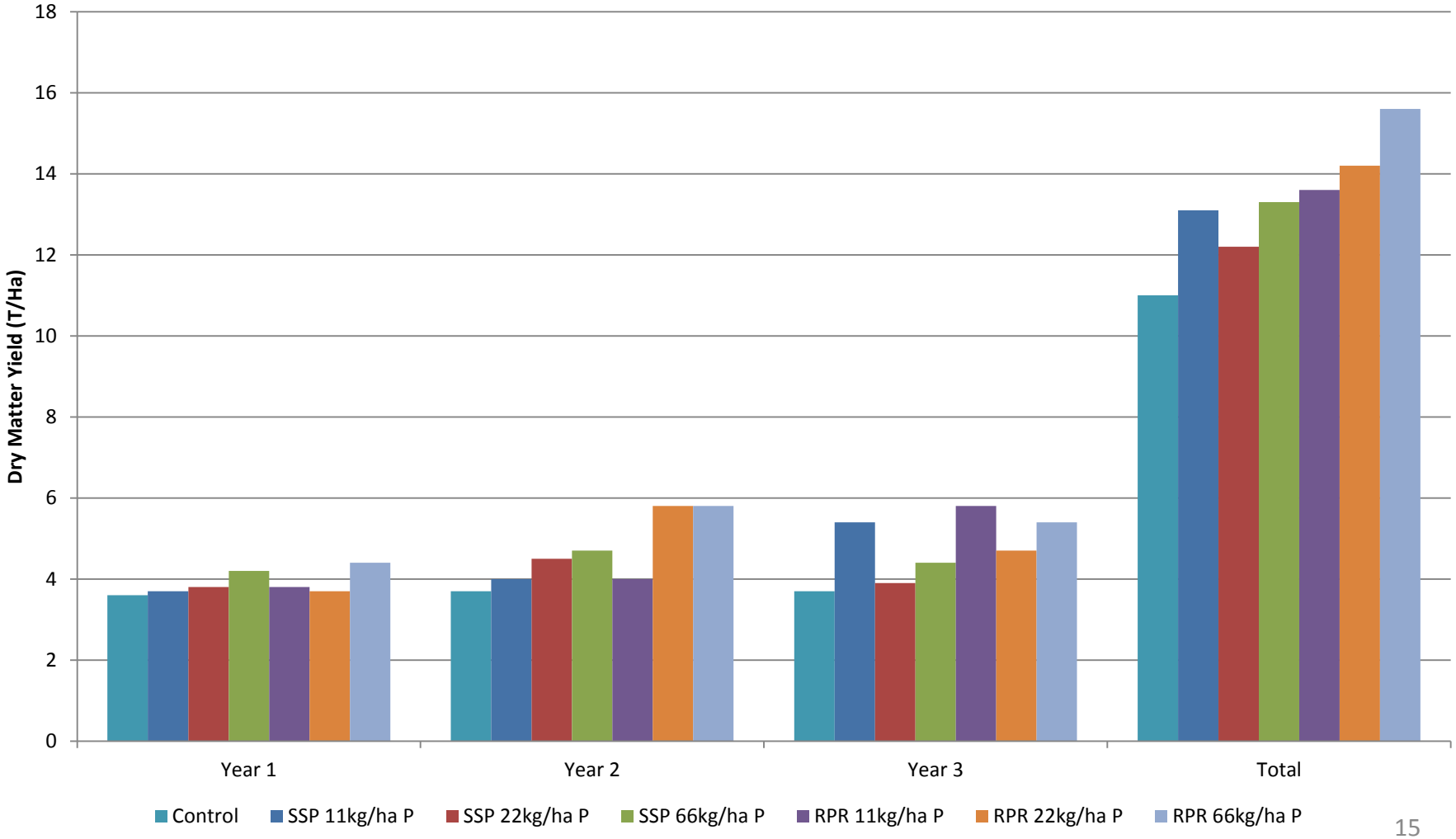


Total Dry Matter Production (T/Ha)



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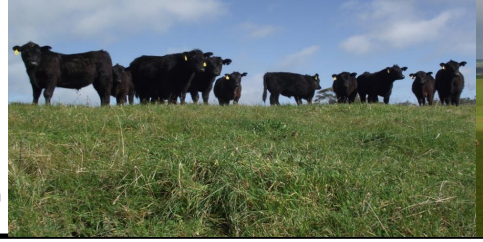

Phosphorus Uptake (kg/ha)

	Year 1	Year 2	Year 3	Total
Control	7.7	5.5	3.5	16.7
SSP 11kg/ha P	8.8	5.8	9.0*	23.6
SSP 22kg/ha P	10.1	7.4	4.0	21.5
SSP 66kg/ha P	12.1	8.1	4.2	24.4
RPR 11kg/ha P	8.7	7.1	7.8*	23.6
RPR 22kg/ha P	10.0	10.4	4.3	24.7
RPR 66kg/ha P	11.9	15.9	6.9	34.7

* Signifies an additional application of SSP

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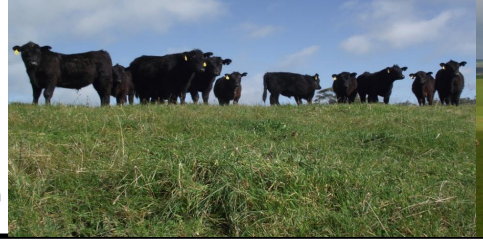

Soil Phosphorus Content (ppm)

	Year 1	Year 2	Year 3	Year 4
Control	33	12	8	7
SSP 11kg/ha P	22	14	9	-
SSP 22kg/ha P	26	19	9	6
SSP 66kg/ha P	38	27	11	9
RPR 11kg/ha P	34	25	13	-
RPR 22kg/ha P	42	27	19	9
RPR 66kg/ha P	82	67	44	16

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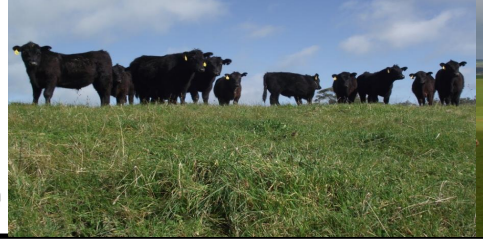

Agronomy Field Trials – Pivot Limited

Reactive Rock Evaluation

Published 1996

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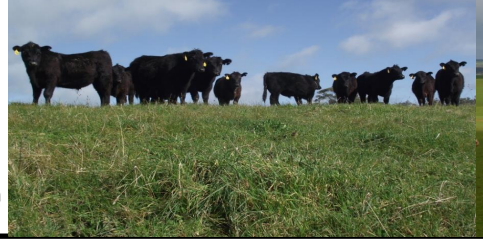

Aim of Study

- Effect of various forms of phosphorus on pasture production on a newly established pasture
- Monitor pasture production (kg DM with 3 sources of phosphorus as topdressing options)
- To ascertain role of phosphorus and sulphur in dryland pasture production

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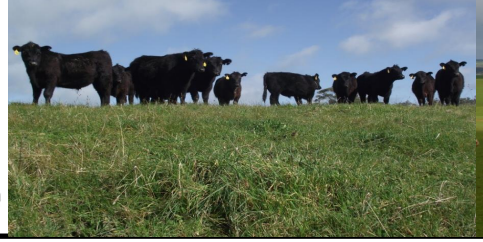

Materials & Method

- Plot size 7m x 15m
- Standard application rate was 15 kg/ha of P
- P applications occurred in early February
- Dry matter yield was determined in October using a rising plate meter
- Soil phosphorus and sulphur levels were evaluated post harvest

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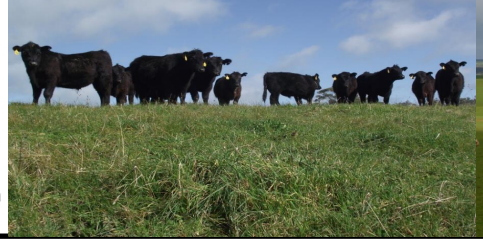

Treatment List

Treatment	Product	Rate (kg/ha)	P	K	S	Mg
1	NIL	0				
2	SSP	175	15		19	
3	TSP	75	15		0.7	
4	RPR	112	15			
5	Prolong	158	15		24	
6	TS9	99	15		9	
7	TS18	94	15		18	
8	AMF AgroPhos	250	15	2.5	7.5	
9	AMF MagPhos	250	15	2.5	15	7.5

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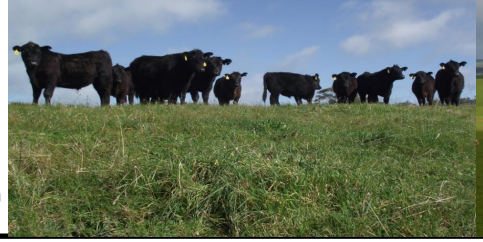

Site Characteristics

- Soil contained 2.7% OC, 224ppm available K, 14ppm colwell P and a pH of 5.9 (water)
- Annual rainfall 760mm (30inches)
- Subterrean clover was the dominant species

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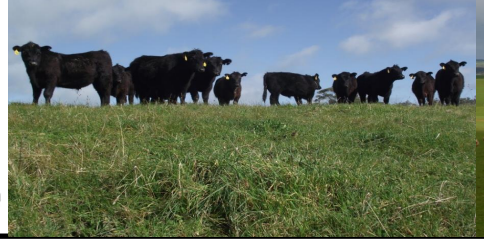

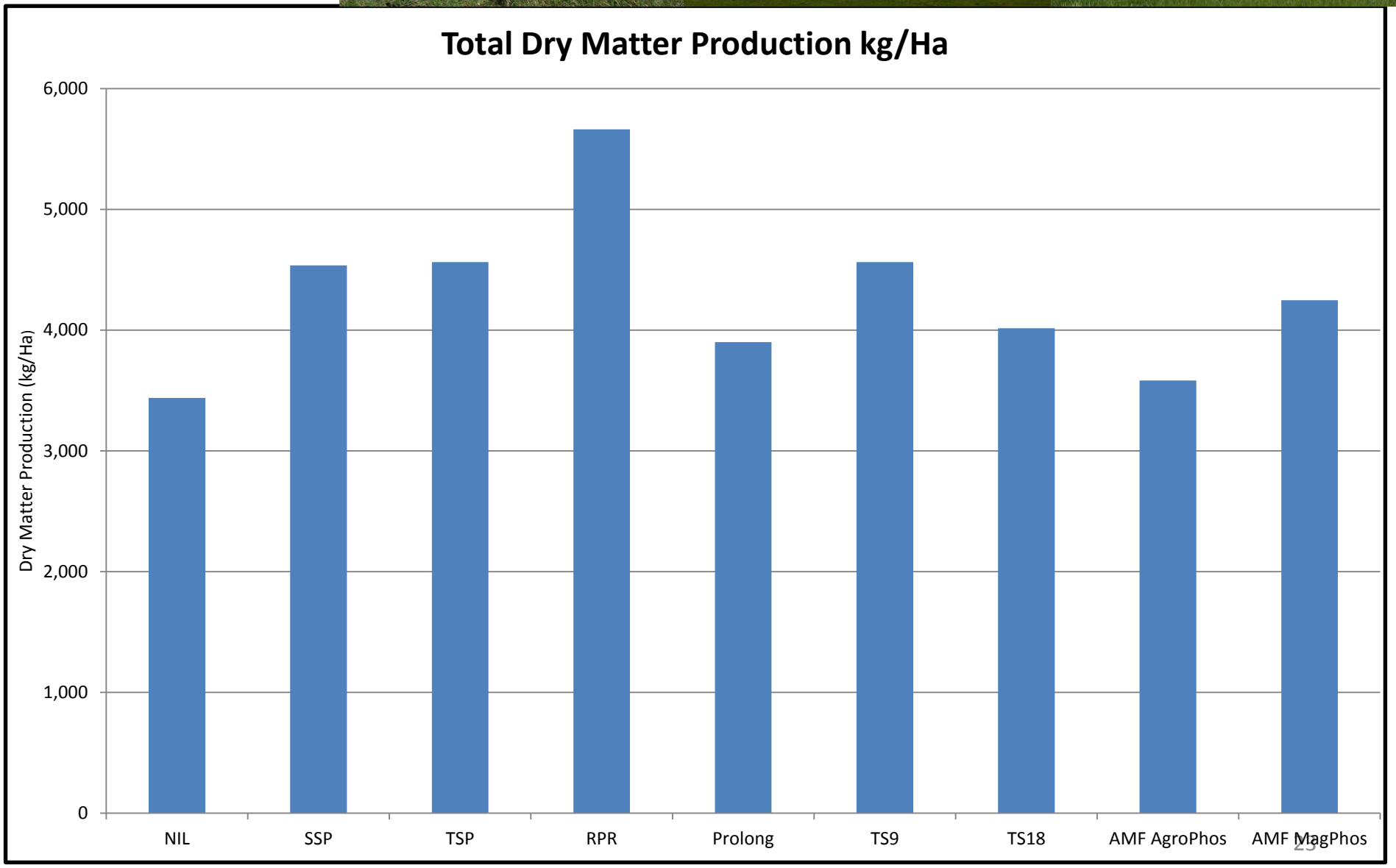

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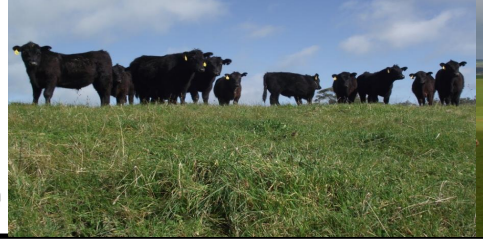

Residual soil P & S levels

Treatment	Soil P content (ppm)	Soil S content (ppm)
NIL	9	10.5
SSP	16	7
TSP	15	8.3
RPR	14	6.9
Prolong	13	8.9
TS9	17	5.5
TS18	10	14.1
AMF AgroPhos	12	7.1
AMF MagPhos	13	6.2