



1985

# Phosphorus nutrition of high rainfall pastures, Sulphur nutrition of pastures and Sulphur - low rainfall.

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DEPARTMENT OF AGRICULTURE  
WESTERN AUSTRALIA

SUMMARY OF FIELD EXPERIMENTS 1985

Phosphorus nutrition of high rainfall pastures - Peel Harvey Estuarine System  
Study and related phosphorus work (4054EX)

- (1) Sources, rates, time of application of phosphorous on high rainfall pastures. 81AL5, 81AL6, 82AL10, 82HA32, 83HA26, 83HA27.
- (2) P sources and rates on sandy soils of the high rainfall areas. 84AL33, 84AL34, 84HA18, 84HA25.
- (3) Maintenance rate of P on pastures on sandy soils. 84AL32, 84HA17, 84HA24, 84 HA28.

Sulphur nutrition of pastures

A. Sulphur - high rainfall (2684 EX/4054EX)

- (1) Sources, rates, time of application of sulphur to pastures. 80AL4, 80AL4B
- (2) S sources and rates on pastures on sandy soils of the high rainfall areas. 84HA20, 84HA27
- (3) Maintenance rate of S on pastures on sandy soils. 84AL35, 84HA19, 84HA26

B. Sulphur - low rainfall (4067EX)

- (1) Sulphur on pastures. 82AL9, 82KA4
- (2) Sulphur reuirements of wheat. 85TS24

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## GENERAL SUMMARY

The experimental work summarized here was commenced with the aim of improving the efficiency of phosphorus usage on high rainfall area pastures with a view to minimize leaching losses, particularly on the coastal catchment of the Peel Harvey Estuary. A number of potential ways of improving P use efficiency exist, and this program is concerned only with the following:-

1. The development of accurate soil tests for predicting phosphorus requirements on high rainfall area pastures, particularly sands.
2. The development of phosphorus fertilizers which supply nutrients to match plant requirements more appropriately (i.e. at least as cheaply, and with less leaching losses) than superphosphate in leaching environments.
3. The establishment of fertilizer residual value functions to enable prediction of both long term P requirements and leaching losses.
4. The establishment of relationships between P and other pasture nutrient requirements (particularly S and K).

### 1. Phosphorus soil tests

In 1983 a phosphorus, sulphur, potassium fertilizer recommendation model 'Phosul K' was developed using methodology similar to that of 'Decide' and data obtained from this and previous research programmes. In the model oxalate - extractable ('reactive') iron is used to determine appropriate P soil test and P response C parameters. That is, the model assumes that P response characteristics are a function of soil P adsorption capacity, which itself is assumed to be related to reactive iron content. No additional work was carried out in this area in 1985, but further work is planned.

### 2. Alternative phosphorus sources

Extensive laboratory, glasshouse and field work was carried out in 1985 on various aspects of the cost effectiveness of 'slow release' P sources. This summary reports only field data.

### 3. Fertilizer residual value functions

For reliable long-term predictions of fertilizer effectiveness residual value functions must be delineated. Four 10 year duration trials were established in 1984 to further examine to long term leaching and effectiveness of superphosphate and the 'slow release' P sources shown to be most cost effective in previous work on leaching sands. Two additional trials will be commenced in 1986. Soil and pasture P levels will be monitored continuously so that estimates of long-term field losses can be made.

### 4. The relationship between P and other pasture nutrient requirements

Existing information was incorporated into the Phosul K model. Apart from continuing sulphur trials no further work was conducted in 1985.

SOURCES OF PHOSPHORUS USED IN EXPERIMENTAL WORK

Abbreviation	Source	water soluble	citrate soluble	% of P as citrate insoluble	Total P content (%)
Super*	superphosphate	84	9	7	10
	Triple superphosphate				19.7
LS*	lime reverted superphosphate (AFL)	9	50	41	5.4
LS2*	lime reverted superphosphate	32	55	12	8.3
LS3*	(CSBP)				
CS	(old) coastal superphosphate	17	71	12	7.1
AS1*	partially acidulated rock phosphate	22	15	65	9.6
AS2	(GRP (1)) +				
AS3*#	elemental sulphur	20	13	66	9.8
NCS##	(new) coastal superphosphate				9.1
GRP (1) *	Christmas Island A grade	<1	10	90	16
GRP (2) *	rosh phosphate				
GRP (3) *	Duchess rock phosphate	<1	18	92	13.7
QRP					
RR	'Reactive' North Carolina rock phosphate				13.5
C500*	calcined Christmas Island c grade rock phosphate	<1	66	33	14.0
CORE	Christmas Island C grade rock phosphate	0	0	100	11.2

\* = as analysed

# = new coastal superphosphate (trial batch)

## = commercial (new) coastal superphosphate

Particle sizes	>20 um	>106 um
GRP (1)	77	31
GRP (2)	67	13
GRP (3)	73	18
C500	79	28

NB Clay	<2 um
Silt	2-20 um
Fine sand	20-200 um

SOURCES, RATES, TIMES OF APPLICATION OF PHOSPHORUS FERTILIZERS  
TO LEGUME PASTURES ON THE BASSENDEAN AND COOLUP SANDS  
(PEEL-HARVEY CATCHMENT)

- Aims: 1. To compare sources and rates of slow release phosphorus fertilizers, applied at the break with rates and times of application of triple superphosphate.
2. To assess the value of the above in subsequent years.

Trials:

Trial	Location	Soil	Bicarb P (ppm)
82HA32	Forestry, McClarty	0-90 cm grey, white sand > 90 cm yellow sand	New land 1982
83HA26	Dawe, North Dandalup	0-60 cm grey sand > 60 cm clay	1982 Nil 0-10 cm: 12
83HA27	Dawe, North Dandalup	0-60 cm grey sand > 60 cm clay	New land 1983 Bic P 8

Basals: 100 kgs/ha KCl, 100 kgs/ha Gypsum applied at 0, 6 and 12 weeks.

Management: Mowing and removal of mowings at 12 weeks. No grazing.

82HA32

Results: DM yield (kg/ha) 8/8/85. Mean of 3 reps.

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P rate (kg/ha)	Super applied				LS2 3/82	LS3 3/82	RR 3/82	GRP(1) 3/82	C500 3/82
	3/82	3/83	3/84	3/85					
0	540								
10	470	600	880	790		470			
20	660	530	650	1260	600	620	740	530	660
40	640	1490	1190	1140	990	1860	1840	1210	1260
80	1920	1380	2280	1970	2620	2060	1880	1710	
160	3440	2290	1720	1160	2690	2990	3120	2390	2190
200	3200	2800	870	2790	2890	2450	3140	2190	

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Results DM yield (kg/ha) 16/9/85. Mean of 3 reps.

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P rate (kg/ha)	Super applied				LS2 3/82	LS3 3/82	RR 3/82	GRP(1) 3/82	C500 3/82
	3/82	3/83	3/84	3/85					
0	820								
10	820	790	890	930		830			
20	840	810	850	1040	860	840	940	850	1070
40	850	1070	1050	1230	920	1200	1100	940	980
80	1250	1010	1260	1450	1170	1320	1170	1130	1110
160	1280	1330	1240	1100	1350	1390	1370	1180	1330
200	1470	1340	1410	1040	1370	1400	1300	1410	1230

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Summary:

Phosphorus responsive. Residual value data to be calculated for super and other sources.

1986: Trial to be terminated.

83HA26, 83HA27

No data 1985. Composition and plot definition problems. Trials terminated.

SOURCES, RATES, TIME OF APPLICATION OF PHOSPHOROUS FERTILIZERS ON PASTURES ON LEACHING SANDS OF THE HIGH RAINFALL AREAS.

Aims: To assess the current and residual value of various sources of phosphorous on pastures on deep sands in the high rainfall areas.

Trials:

Trial	Location	Soil
81AL5	Denmark Ag. School	0>60cm organic grey sand (wet)
81AL6	Hedderwick, Elleker	0-10cm organic mat. 10>80cm grey sand (wet)
82AL10	Barrow, Bow Bridge	0>100 cm coarse grey/white sand

Basals: 100 kgs/ha CK1 and 150 gs/ha Gypsum at 0 and 20 weeks. 50 kgs/ha FeSO<sub>4</sub> at 0 weeks. (81AL5, 81AL6, 82AL10)

Management: Mowing and removal. No intentional grazing.

81AL5

Results: DM yield (kg/ha) 22/10/85. Mean of 2 reps.

P rate (kg/ha)	Super applied	AS3	LS	AS1	AS2	GGRP1	GRP2	GRP3	CORE	C500			
	4/81	3/82	3/83	3/84	3/83	4/81	4/81	4/81	4/81	4/81	4/81		
0	500												
10	950	450	680										
20	540	560	1240	1410		650	590	790	460	570			
40	920	1770	3170	1460	3520	840	1520	1100	1170	1400	2190	550	1130
80	2130	1640	2720	4280	4470	2810	3390	2560	3380	4240	3420	860	2320
120	2730	5410	4840	4410	3460	4360	4990	5380	3680	3650	4950	1030	4260
180	4650	4900	5090	5250	4700	5480	3150	4960	4650	5629	6360	1050	610

Summary:

A very useful P responsive site. Early growth eaten by kangaroos (no early assessment). Trial will be continued to follow P run down, but no provision can be made for currently applied P as the plots are all treated and too small for cross-stripping

1986: Trial to be continued



81AL6

RESULTS: DM Yield (kg/ha) 19.7.85. Mean of 2 Reps.

P rate (kg/ha)	Super Applied						AS3	LS	AS1	AS2	GRP	GRPS	ORP	CORE	C500
	4/81	6/81	7/81	3/82	3/83	3/84	3/83	4/81	4/81	4/81	4/81	4/81	4/81	4/81	4/81
0	1890														
10		2050	1710	1990	1710	1850									
20		2180	1640	1700	2440	2140	1410			2060	1690	2460	1540	1640	1700
40	2390	1680	2270	1600	1790	2680	3520	2380	2140	2000	2020	2070	1680	1760	2070
80	2160	2160	2250	1980	1880	2290	4470	2530	2200	2110	1700	2560	1890	1750	2300
120	1950	2770	2120	2170	2130	2000	3460	2040	2100	2410	2130	2400	1850	2290	2250
180	1670			1860	2170	2490	4700	2520	2460	2010	1970	1860	2050	1800	2510

Summary: Variable, non P-responsive site.

1986 : Trial to be terminated

82AL10

Results: DM yield (kg/ha) 18/7/85. Mean of 2 reps.

P rate (kg/ha)	Super applied			AS3	LS	GRP(1)	AS1	C500
	4/82	3/83	3/84	3/83	4/82	4/82	4/82	4/82
0	530							
10		510	700	790				
20		590	980	640				580
40	1120	960	1020	1530	1240	1460	2270	870
60	1740	1610	2440	1540	1550	1680	1400	1640
80	1610	1660	1560	1610	1450	1720	1650	1720
100	1710	1760	2630	1180	2300	2550	1700	1790
120	1930	1740	2080	2380	1880	2220	3350	1900
160	1730	1820	1830	2190	3100	2770	1860	2130
200	2430	2380	2910	1320	3330	2220		2020

Results: DM yield (kg/ha) 16/10/85. Mean of 2 reps.

P rate (kg/ha)	Super applied			AS3	LS	GRP(1)	AS1	C500
	4/82	3/83	3/84	3/83	4/82	4/82	4/82	4/82
0	190							
10		320	320	310				
20		330	430	460				240
40	510	470	410	750	340	440	1730	360
60	490	650	740	1310	630	840	1400	570
80	560	650	740	1580	860	1140	760	820
100	510	960	1310	1600	1080	1250	1010	1020
120	890	1070	1220	1870	1310	1020	1470	770
160	1440	1180	1220	2190	1880	1430	1870	1900
200	1510	1540	1470	2080	1690	1730		1660

Summary:

Site subject to rapid haying off in spring. P responsive, but difficult to manage. Useful data has been collected.

1986: Trial to be terminated

MAINTENANCE RATE OF P ON PASTURES ON SANDY SOILS

Aims: To determine maintenance (annual, fixed) rates of P applications of various sources of P.

To determine differences in buildup of various soil P fractions with different P sources.

To determine (in subsequent work) long term P leaching losses associated with usage of various P sources and rates.

Trials and Site Characteristics:

Trial (4054EX)	Location	Soil	P (ppm)
84AL32	Denmark Agricultural High School	0-10cm grey sand >80cm white sand	New land
84HA17	White, West Harvey	0-80cm grey sand	New land
84HA24	Alcoa, Pinjarra	0-10cm grey sand 10-50cm sandy clay >50 cm clay	Very old land P>50
84HA28	Marsdon, West Yarloop	0-80cm grey sand	Old P>10

Basals: 100 kgs/ha KCl and 150 kgs/ha gypsum at 0 and 20 weeks.  
100 kgs/ha FeSO<sub>4</sub> at 0 weeks. (84AL32, 84HA17), 150  
kgs/ha Gypsum and 100 kgs/ha KCl at 0 and 20 weeks. 100  
kgs/ha FeSO<sub>4</sub> at 0 weeks. (84HA24, 84HA28).

Management: Mowing and leaving clippings

84AL32

Results: DM rate (1-5) 16/10/85. Sum of 3 reps.

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P rate (kg/ha) annually	Super	NCS	GRP(1)	C500
0	3.5			
2.5	4	3	3.5	3
5	3	3	4	5
10	3.5	3	4	4
20	6	4.5	6	6
40	8.5	7.5	4.5	5.5
100	10	9	7	7

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Summary:

Long-term trial. Difficulty has been experienced with establishing a good pasture cover for a number of reasons (non-wetting soils, early seasonal finishes). Useful data should be available in future years. Site to be completely reseeded March 1986.

1986: Trial to be continued.

84HA17

Results: DM yield (kg/ha) 6/8/85. Mean of 3 reps

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P rate (kg/ha) annually	Super	NCS	GRP(1)	C500
0	840			
2.5	1190	1090	2300	1390
5	1290	1280	970	1140
10	1750	1750	1180	1200
20	2010	1660	1460	1180
40	2960	1590	1690	1040
100	2330	2860	1970	1130

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Results: DM yield (kg/ha) 10/10/85. Mean of 3 reps

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P rate (kg/ha) annually	Super	NCS	GRP(1)	C500
0	1670			
2.5	2220	2510	2880	3470
5	2780	2480	2160	2790
10	3320	6870	3400	2960
20	3270	4340	4140	2460
40	4650	4310	4910	2750
100	4560	4030	4650	2260

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Summary:

C500 treatments not applied in 1985 (unavailable). A useful very P responsive long-term site

1986: Trial to be continued

84HA24

No data 1985 due to failure in attempted pasture manipulation. Difficult site to manage

1986: Trial to be continued, subject to review autumn/winter 1986.

84HA28

Results: DM yield (kg/ha) 9/10/85. Mean of 3 reps

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P rate (kg/ha) annually	Super	NCS	GRP(1)	C500
0	2670			
2.5	3630	3120	2490	2860
5	2860	2490	3120	3220
10	2700	2580	2990	3050
20	2520	3110	2480	2790
40	2800	2550	3170	2650
100	2520	2300	3530	3430

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Summary:

Site should be useful for long-term P rundown data but pasture composition has been difficult to maintain. 1985 c500 treatments not applied (unavailable).

1986: Trial to be continued.

P SOURCES AND RATES ON SANDY SOILS OF THE HIGH RAINFALL AREAS

Aims: To relate responses to phosphorous to soil test p.

To determine the shape of the response curve to currently applied phosphorus on a deep sandy soil for 5 consecutive years (4 P sources).

To compare superphosphate, (new) coastal superphosphate, ground apatitic rock phosphate and C500 as sources of P on deep sandy soils (current and residual value) for 6 years.

To determine a residual function for each source on sandy soils

Trials and Site Characteristics:

Trial (4054EX)	Location	Soil
84AL33	Denmark Agricultural High School	0-10cm grey sand 10>80cm white sand
84AL34	Wehr, Green Range	0-10cm grey sand 10>80cm white/yellow sand
84HA18	White, West Harvey	0-80cm grey sand
84HA25	Alcoa, Pinjarra	0-10cm grey sand 10-50cm sandy clay >50 cm clay

Basals: 100 kgs/ha KCl, 150 kgs/ha gypsum (split application) 50 kgs/ha FeSO<sub>4</sub> at 0 weeks for all trials

Management: Mowing and leaving clippings

84AL33

Results: DM rate (0-5) 16/10/85. Sum of 3 reps

P rate (kgs/ha)	Super		NCS		GRP(1)		C500
	4/84	4/85	4/84	4/85	4/84	4/85	4/84
0		1					
30	6	4	5.5	5	0	1	1.5
60	1.5	11	0.5	11	1.5	1.5	1.5
125	9	6	4	10	1.5	5.5	2
250	8.5	2	4	6	3	4	5.5
500	3	2	2	6.5	5.5	5	5
1000	2.5	1	2	6	9.5	8	4

Summary:

A difficult site. Toxicity at high super and NCS rates. 1985 C500 treatments not available. To be reseeded in April-May 1986 (see comments under 84AL32)

1986: Trial to be continued.

84HA18

Results: DM yield (kg/ha) 6/8/85. Mean of 3 reps

P rate (kg/ha)	Super		NCS		GRP(1)		C500
	4/84	4/85	4/84	4/85	4/84	4/85	4/84
0	1000						
30	1770	3170	2340	2800	2390	3340	3490
60	2530	3130	3400	4080	3920	4710	3360
125	3140	4240	4090	5060	4380	5310	4240
250	3910	4800	3030	3080	3320	4830	4810
500	3720	5010	2530	3960	4680	5040	4240
1000	3760	2290	1250	2100	4020	4530	4650

Summary:

A good P responsive site for P residual estimation. Toxicity at high super and NCS P rates (Super, NCS) 1985 C500 treatments not available.

1986:

Trial to be continued.

84AL34, 84HA25

No data 1985 due to pasture growth problems. 84AL34 to be resown May 1986. See comment under 84HA24 for 84HA25. Data should be available in 1986.

1986: Trials to be continued



SOURCES OF SULPHUR USED IN EXPERIMENTAL WORK

- NCS New coastal superphosphate (30%S, 3% sulphate) all elemental sulphur < 0.5 mm.
- AS3 As for NCS
- SF45 Sulphur fortified superphosphate 45%S
- ES Elemental sulphur (< 0.15 mm, except as indicated)
- GYP Fine gypsum 17%S (< 2mm, except as indicated)
- SF25 Sulphur fortified superphosphate 27%S

Title Sources, rates, time of application of sulphur to legume pastures.

Aims To generate response curves for sulphur sources on legume pastures.

To assess the residual value of various sulphur sources in the second and subsequent years after application relative to currently applied superphosphate.

Trials and Site Characteristics

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Trial (4054EX)	Location	Soil
80AL4 80AL4B sand	Anderson, Cuthbert	0-10cm grey sand 10>80cm white

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Basals: Nil basals for 80AL1 and 80AL4. 300 kg/ha Aerophos and 100 kg/ha KCl (split application) applied to 80AL4B.

Management: Flash grazing with sheep (all trials).

80AL4

Results: DM rate (1-5) 17/10/85. Sum of 3 reps

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S rate (kg/ha)	Super applied				NCS 3/84	AS3 3/83	SF25 3/80	SF45 3/80	ES 3/80
	3/81	3/82	3/83	3/84					
0	4.5								
5		7	6	4.5	5	7			
10		5	3.5	6.5	5.5	4			
20		4	4	9	9	7	7.5	5.5	
40	5	4	5	12	4.5	8.5	7	8	
80	5	4	7	5	9	5.5	5.5	6	6

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**Summary:**

No quantitative assessment 1985 (site accidentally grazed)

Variable, but no residual value apparent except for 1984 treatments (super, NCS)

1986: Plots to be used for a new sulphur trial (not 1984 treatment plots)

80AL 4B

RESULTS: DM yield (kg/ha) 17.10.85. Mean of 3 reps

S rate (kg/ha)	Super Applied		AS3	ES	ES	ES	ES	ES	GYP	GYP	GYP	GYP	GYP
	3/83	3/84	3/84	<0.15	0.15-0.25	0.25-0.50	0.50-2.0	2-5	<2	2-4	4-6	6-10	>10
Particle Size Range (mm)													
<i>APPLIED 3/84</i>													
0	1620												
5	1790	1820	1900	1910	2130	2120	1790	1430	2050	1450	2440	3250	1880
10	1800	2000	1790	1990	2080	1990	1730	2000	2030	2320	2010	3260	2110
20	1950	2760	2120	1740	2280	1920	2120	2270	1910	2740	2400	2220	2140
40	1710	3220	2030	1950	1640	2080	1790	2240	1900	2190	2350	2500	2990
80	2230	3380	2860	2180	2190	2470	2930	2170	1650	2270	2950	2230	3960

Summary: Useful data on sulphur residual. Similar trial to be established on adjacent area in 1986 to obtain data from the first two years after application (not obtained from this site due to capeweed dominance of the pasture).

1986 : Trial to be continued.

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## S SOURCES AND RATES ON SANDY SOILS OF THE HIGH RAINFALL AREAS

**Aims:** To determine the shape of the response curve to currently applied S for 5 consecutive years (2 S sources).

To compare superphosphate and (new) coastal superphosphate as S sources (current and residual value) for 6 years.

To determine a residual value function for each source.

### Trials and Site Characteristics

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Trial (4054EX)	Location	Soil
84HA20	White, West Harvey	0-80cm grey sand (new land)
84HA27	Alcoa, Pinjarra	0-10cm grey sand 10-50cm sandy clay >50 cm clay (old land)

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**Basals:** 200 kg/ha Aerophos, 200 kg/ha KCl, for 84HA20. 200 kgs/ha KCl (split) for 84HA27

**Management:** Mowing and leaving clippings.

84HA20

Results: DM yield (kg/ha) 11/10/85. Mean of 3 reps

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S rate (kg/ha)	Super		NCS	
	4/84	4/85	4/84	4/85
0	3870			
15	3010	4190	2980	3330
30	3430	4600	5110	3470
60	4300	4520	4230	3420
125	2760	4650	3380	4820
250	4520	4650	5240	4616
500	3780	2860	4540	4530

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Summary:

Sulphar response on some plots but extremely variable between reps, possibly due to winter inundation with water high in sulphate.

1986: Trial to be continued, subject to review autumn/winter 1986.

MAINTENANCE OF S ON PASTURES ON SANDY SOIL

Aims: To determine maintenance (annual, fixed) rates of sulphate and elemental S (as (new) coastal superphosphate) applications to maintain various levels of pasture growth over a number of seasons (i.e. maintenance rate response curve).

To determine long-term S leaching losses associated with various S sources and rates.

Trials and Site Characteristics:

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Trial (4054EX)	Location	Soil
84AL35 New land	Denmark Agricultural High School	0-10cm grey sand 10>80cm white sand
84HA19 New Land	White, West Harvey	0-80cm grey sand
84HA26 Very old Land	Alcoa, Pinjarra	0-10cm grey sand ) Coolup 10-15cm sandy clay ) Sand >50cm clay )

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Basals: 200 kg/ha Aerophos, 200 kg/ha KCl, (split application) for 84AL35, 84HA19. 200 kg/ha KCl (split) for 84HA26.

Management: Mowing and leaving clippings

84AL35

Results: DM rate (1-5) 16/10/85. Sum of 3 reps

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S rate (kg/ha) annually	Super	NCS
0	2.5	3
2.5	4.5	3
5	4	4
10	5.5	5
20	6.5	4.5
40	6.5	9
100	4.5	9

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Summary:

Pasture problems, but a useful S responsive site. To be reseeded 1986 (see comments for 84AL32)

1986: Trial to be continued

84HA19

Results: DM yield (kg/ha) 10/10/85. Mean of 3 reps

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S rate (kg/ha) annually	Super	NCS
0	2440	
2.5	2180	2530
5	2020	2260
10	3390	3770
20	3520	4460
40	4890	5070
100	5100	5020

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Summary:

Responsive site. NCS more effective as S source than super in 1985. Useful for S maintenance rate definition

1986: Trial to be continued.

## SULPHUR REQUIREMENTS OF WHEAT

Aims: To establish the sulphur requirement of wheat on S deficient soils cropped with low S fertilizers, and the effect of N on S requirement.

To establish diagnostic criteria for S deficiency (tissue and grain).

### Trials and Site Characteristics:

Trial (4067EX)	Location	Soil
85TS24	Boak, West Three Springs	0>100cm pale yellow sand

Basal fertilizers: Trial had been cropped with DAP 1984, super on pasture in 1983. 100 kg/ha KCL, 2 kg/ha ZnO applied at seeding.

Trial details: Seeded 9/6/85 with 50 kg/ha Jacup wheat and TSP or DAP (see below). S as gypsum applied 2 weeks after seeding. Additional N applied 5 weeks after sowing.

Treatments: 1-5 TSP, 150 kg/ha at seeding  
10-25 DAP 150 kg/ha at seeding  
11-25 Agran (76, 147, or 294 kg/ha 5 weeks after seeding)

Results: DM yield (kg/ha) Calibrated rate 15/8/85

S rate kg/ha	N rate (kg/ha)				
	0	24	50	100	200
0	380	440	560	620	560
5	500	500	560	620	680
10	440	380	620	680	740
20	380	440	620	740	740
40	500	320	740	740	740

Colour rate 15/8/85 (1 = pale, yellow 5 = green) Sum of 2 reps

S rate kg/ha	N rate (kg/ha)				
	0	24	50	100	200
0	3	3	5	6	4
5	4	4	8	7	7
10	5	5	7	9	10
20	3	5	8	10	10
40	5	3	10	10	10

DM yield, quadrat cuts of 1 rep only (kg/ha) 17/9/85

S rate kg/ha	N rate (kg/ha)				
	0	24	50	100	200
0	1430	2160	2840	3090	2890
5	2350	2520	2880	3920	3110
10	3050	2280	2790	3620	4250
20	2470	2170	2550	3940	3550
40	2350	2260	3260	3570	3890



Grain yield 11/1985 (kg/ha) Mean of 2 reps

S rate kg/ha	N rate (kg/ha)				
	0	24	50	100	200
0	1080	1420	1880	1580	1460
5	1410	1240	1370	1790	1550
10	1630	1460	1780	1570	1550
20	990	1340	1510	1720	1760
40	1380	1110	1850	1810	1030

Summary: Obvious S deficiency symptoms during the season, but dry spells August - September made 17/9/85 cut and final yield variable.

Possible dry matter and grain yield response to S (17/9/85 cut, final harvest).

1986: Trial to be repeated on a nearby site (in the same paddock).