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1969

# 1969 Results of Field Experiments

Tony Albertsen

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DEPARTMENT OF AGRICULTURE, W.A.

PLANT RESEARCH DIVISION

1969 RESULTS OF FIELD EXPERIMENTS

T.O. Albertsen

TITLE: Maintenance Phosphorus and Sulphur for Pasture  
- Low Rainfall.

AIM: a) Determination of rates of P and S required for maintenance of optimum pasture growth on old land, using individually grazed plots.  
b) To determine the best ratio of gypsum and phosphate fertiliser for maintenance of optimum pasture growth.

LOCALITIES: Geraldton, Katanning, Lake Grace (2), Merredin, Moora (2), Narrogin, Northam (5), Three Springs (2), and 3 replications each on Avondale, Chapman, Newdegate and Wongan Hills research stations.

YEAR STARTED: 1965 onwards.

1969 RESULTS:

No results on pasture growth in 1969 due to the influence of the drought. The trial at Chapman Research Station was cropped without any fertiliser application, the treatment yields are listed below:

Treat	Super	Triple (lb/ac)	Gypsum	P <sub>2</sub> O <sub>5</sub>	S (lb/ac)	Mean Yield (bus/ac)
1	0	0	85	0	14.4	8.6
2	30	0	63.75	6.6	14.4	9.2
3	60	0	42.5	13.2	14.4	9.7
4	90	0	21.25	19.8	14.4	9.6
5	120	0	0	26.4	14.4	11.6
6	0	60	0	26.4	2.4	11.1
7	0	60	15	26.4	5.9	10.7
8	0	60	35	26.4	9.3	11.3
9	0	60	55	26.4	12.7	10.8
10	0	60	75	26.4	16.1	10.6

Little response to increasing residual P at constant S is evident. Similarly, little response to increasing residual S at constant P is evident. The crop yields are noticeably low despite no fertiliser application and are attributed to the drought conditions.

TITLE: Sulphur Spot Trials.

AIM: To determine the sulphur response of a new soil with respect to source and rate of sulphur.

LOCALITIES: Geraldton (2), Jerramungup, Newdegate Research Station and Salmon Gums Research Station.

YEAR STARTED: 1969

1969 RESULTS: No results due to establishment problems and moisture shortages.

TITLE: Continuous Cropping Trial with N.P.S.

AIM: To determine the number of continuous croppings for several soil types using N, P and S fertilisers.

LOCALITIES: Katanning, Merredin, Narrogin, Northam and Three Springs.

YEAR STARTED: 1969

1969 RESULTS: Crop (wheat) yields are tabulated below. The Northam trial was not harvested due to the intrusion of sheep into the trial area just prior to harvest time.

69KA1

N	P <sub>2</sub> O <sub>5</sub> (lb/ac)	S	Nil or Mineral S	Compound (28:14)	Super + Urea (bus/ac)	Compound + Gypsum	Compound + Mineral S	MEAN
0	0	0	14.0					14.0
11.5	5.75	0		12.8				12.8
23.0	11.50	0		15.7				15.7
34.5	17.25	0		15.8				15.8
11.5	5.75	3.1			13.3	15.3	14.7	14.4
23.0	11.50	6.3			16.5	16.7	15.7	16.3
34.5	17.25	9.4			15.7	16.5	14.9	15.7
0	0	9.4	13.1					13.1
MEAN				14.8	15.2	16.2	15.1	

69ME1

N	P <sub>2</sub> O <sub>5</sub>	S						MEAN
0	0	0	6.2					6.2
11.5	5.75	0		8.8				8.8
23.0	11.50	0		9.8				9.8
34.5	17.25	0		9.8				9.8
11.5	5.75	3.1			7.8	8.1	7.9	7.9
23.0	11.50	6.3			8.3	8.3	9.3	8.6
34.5	17.25	9.4			8.5	9.4	9.4	9.1
0	0	9.4	6.2					6.2
MEAN				9.5	8.2	8.6	8.9	

## 69NA1

N	P <sub>2</sub> O <sub>5</sub> (lb/ac)	S	Nil or Mineral S	Compound (28:14)	Super + Urea (Bus/ac)	Compound + Gypsum	Compound + Mineral S	MEAN
0	0	0	18.3					18.3
11.5	5.75	0		21.2				21.2
23.0	11.50	0		22.8				22.8
34.5	17.25	0		22.8				22.8
11.5	5.75	3.1			20.8	22.2	19.5	20.8
23.0	11.50	6.3			20.7	25.2	24.0	23.3
34.5	17.25	9.4			25.4	26.2	23.3	25.0
0	0	9.4	18.8					18.8
MEAN				22.3	22.3	24.5	22.3	

## 69TS1

N	P <sub>2</sub> O <sub>5</sub>	S						MEAN
0			14.9					14.9
11.5				15.3				15.3
23.0				14.3				14.3
34.5				15.5				15.5
11.5					14.1	14.7	15.4	14.7
23.0					14.7	17.5	16.5	16.2
34.5					15.5	15.4	15.7	15.5
0			14.4					14.4
MEAN				15.0	14.8	15.9	15.9	

The levels of significant variation between replications, treatments etc. of the four harvested trials are listed below:

## Significance levels

Variance due to	d of f	69KA1	69ME1	69NA1	69TS1
Replications	2	0.01	0.05	0.01	0.05
Treatments	13	0.01	0.001	0.001	n.s.
Nil vs The Rest	1	n.s.	0.001	0.001	n.s.
S vs N.P. + N.P.S.	1	0.01	0.001	0.001	n.s.
N.P. vs N.P.S	1	n.s.	0.05	n.s.	n.s.
Rate of N.P.	2	0.01	n.s.	n.s.	n.s.
Source of N.P.S. (A)	2	n.s.	n.s.	0.01	n.s.
Rate of N.P.S. (B)	2	0.01	0.05	0.001	0.05
(A) X (B)	4	n.s.	n.s.	n.s.	n.s.
Error	22				

## 69KA1

No significant difference between nil and the N.P. and N.P.S. treatments. At corresponding N.P. levels the compound + gypsum treatment outyielded the other treatment sources, but not significantly so. The significant differences ( $p < 0.05$ ) between the rates of N.P. and N.P.S. are both optimised at the 23 lb N and 11.5 lb P<sub>2</sub>O<sub>5</sub>/ac (i.e. = 82 lb C.F/ac).

- 69ME 1 At corresponding N.P. levels the compound treatment source significantly ( $p/0.05$ ) outyielded the N.P.S. treatment sources, the optimum rate being 82 lb/ac. Of the N.P.S. sources the compound + mineral sulphur treatment yielded slightly higher than compound + gypsum or super + urea.
- 69NA 1 A response to N.P. but no overall significant increase in response to N.P.S. despite that at corresponding N.P. levels the compound + gypsum treatment significantly ( $p/0.01$ ) outyielded the other treatment sources, the optimum rate being 123 lb C.F + 52 lb gypsum/ac.
- 69TS 1 No significant treatment responses.

TITLE: Sulphur Status Trials - High Rainfall (2684/EX)

- AIM:
- i) To define the soil types in the high rainfall areas that require S and P for pasture growth.
  - ii) To determine if S (as gypsum) is required in addition to super S; and to
  - iii) Compare autumn to spring gypsum application.

LOCALITIES: Armadale (6), Bridgetown (6), Bunbury (6), Busselton (7), Denmark (6), Harvey (3), Manjimup (6) and Margaret River (6).

YEAR STARTED: 1969

1969 RESULTS:

In approximately  $\frac{1}{3}$  of the 46 trials visual and growth responses to the different P and S treatments were recorded and are summarised on a soil type basis in the table below. Although this table is far from being comprehensive or complete it is reasonably evident that more S than P is required for optimum pasture growth, and that additional S (as gypsum) is required to that S supplied in superphosphate. For example, responses to spring gypsum application were recorded despite the lack of winter rainfall and its consequent leaching effect.

Soil Type of Root Zone	Response to 20 lb P /ac alone	Response to 24 lb S /ac alone	P x S Inter-action	P response at a constant 24lb S/ac.	S response to a constant 20lb P/ac	Response to split gypsum applic.
1. Grey sand white sand	+/- P	+ S	+/-	0 - 10	48	Large
2. Grey sand white sand clay/gravel	- P	+ S	+	10 - 15	30	Medium
3. Grey sand yellow sand	+ P	+/- S	+	20	24	Medium
4. Grey sand Yellow sand clay	- P	+ S	+/-	0 - 10	12	Medium
5. Grey sand Brown sand Clay/gravel	+ P	+ S	-	0	12	Negative
6. Sandy loam gravel/clay	+ P	+ S	0	20	24-48	Small
7. Brown sand yellow sand	+ P	- S	-	20	0	No response
8. Gravel	0 P	0 S	0	0	0	No response

Legend: + = a positive response    +/- = a variable response including both positive & negative responses  
 - = a negative response  
 0 = No response